



Getting Started with UKCA The UKCA Tutorials

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Outline

- What is UKCA and what can I do with it?
- Why should I use it?
- What resources are available?
- Feedback

UKCA Tutorials

• STASH



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What is UKCA?

- UKCA is a Climate-Chemistry-Aerosol model, built as a sub-model of the Met Office's Unified Model (UM).
- UKCA is not a *particular* collection of chemistry and aerosol schemes, but is a **framework** for putting chemistry and aerosol schemes into the UM.



What can I do with UKCA?

- UKCA was originally designed to run for long integrations covering decadal to centennial timescales, but it can also be used for air-quality forecasts
- A number of different chemistry schemes currently exist in the model, covering the troposphere and the stratosphere
 - These schemes are provided because the UKCA developers have wanted to use them for a particular purpose. If they don't suit your needs then you can add to or change them.
 - One aim of the UKCA Tutorials was to teach new UKCA users how to do this







UKCA was included in HadGEM2-ES



Simple scheme designed to simulate tropospheric O3 on centennial timescales to investigate feedbacks.



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An extended version of the simple scheme was also included

Designed to look at feedbacks from the land-surface in shorter *timeslice* simulations.







UKCA also runs in the UM Operational (Forecast) Suite

This is used to provide air-quality forecasts





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UKCA tracer fields can be made to interact with the UM radiation scheme, allowing chemistry-climate feedbacks to be investigated

UKCA was used in the SPARC CCMVal-2 and Lifetime Assessments.

Several modelling groups from the UK, Australia, and New Zealand will submit UKCA data to CCMI







UKCA can be used to ask "what if..."-type questions -

e.g. How many skin cancers have been avoided by the introduction of the Montreal Protocol?



Figure 9. Total numbers of new cases of skin cancer per million people per year avoided by the Montreal Protocol in the year 2030.

van Dijk et al 2013



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The UM atmosphere model can also be coupled to the NEMO ocean model, and UKCA can be run in this configuration

This model is currently being used to perform geoengineering studies in the GeoMIP framework











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Why should I use UKCA?

- Some of the reasons that you should use UKCA are...
 - You want to investigate chemistry-climate or aerosol-climate feedbacks
 - You want to investigate chemistry and aerosol feedbacks on the landsurface or on ocean biogeochemistry
 - You need to make use of the the functionality or diagnostics provided when using UM/UKCA, e.g.
 - Physical parameterisations
 - Nesting and high resolution
 - UKCA satellite emulator, flight-track simulator, double-call aerosol diagnostics, other on-line diagnostics...
 - You want to make use of the large amount of UKCA data available e.g. CMIP5, ACCMIP, CCMVal-2, CCMI...



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Flight track simulator





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What Resources are Available?

- So you've decided to use UKCA, but if you are the only person at your institution using it it can be difficult to get up and running. It can also be very difficult to over-come and solve model problems.
- The UKCA Tutorials have been developed to address this first problem
 - There are also several UKCA standard jobs which are provided on PUMA under the ukca user
 - A UKCA Evaluation Suite is currently under development and is available on MONSooN
- The second issue is addressed by the NCAS Computational Modelling Services team based in Reading
 - http://cms.ncas.ac.uk/



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- A UKCA Evaluation suite is being developed by Mohit Dalvi at the Met Office
- Takes existing scripts developed by the different groups developing UKCA and combines them in a single package
- UKCA jobs output a set of standard diagnostics which are then read by the suite to produce a series of plots to aid model evaluation
- As this contains some IDL programs it is only currently available on MONSooN, but will soon be available on JASMIN
- This suite is also designed to inform the UKCA developers whether or not a candidate job is scientifically suitable for release
 - Future UKCA release jobs will designed to be used for both chemistry and aerosol studies, and so must be suitable for both









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Mean SO4 mass concentration



UM7.3N96L63 CheT+GLOMAP

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UM8.2 Release candidate

What do CMS do?

- CMS provide the PUMA service. This runs the UMUI server which is used to submit UM jobs to ARCHER and MONSooN
 - This means that everyone in the UK (including scientists at the Met Office) can develop and share UM/UKCA jobs from a single codebase
 - CMS port and test UM release jobs from the Met Office on these supercomputers
- They provide UM training, both as an on-line FCM tutorial, and as a 2day workshop
- They provide tools, such as Xconv and Xancil, and the cf-python library
- They provide the CMS Helpdesk



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Helpdesk

Ticket	Summary	Component	Version	Туре	Owner	Status	Created
#1105	Segmentation fault when using the PC2 cloud scheme	UM Model	6.6.3	help	willie	accepted	24/07/13
#1104	UM4.5.1 on HECToR (July 2013)	UM Model	4.5	help	um_support	new	19/07/13
#1103	Error in umui	UMUI	<select version=""></select>	help	um_support	new	19/07/13
#1101	PS31 MOGREPS on MONSooN	UM Model	8.2	enhancement	willie	new	12/07/13
#1100	MOGREPS-R data request	Data	<select version=""></select>	task	um_support	new	12/07/13
#1098	large drift in HadGEM2 concides with change to phase2b	UM Model	6.6.3	help	ros	accepted	10/07/13
#1097	Sending files straight to local computer	UM Model	None	help	ros	new	10/07/13
#1095	Running the UM with SST anomalies	UM Model	7.3	help	willie	accepted	08/07/13
#1092	Radiation diagnostics on different timestep to other variables?	UM Model	6.6.3	help	um_support	new	27/06/13
#1091	problems using sea ice and sst ancillaries	UM Model	6.6.3	help	jeff	accepted	27/06/13
#1088	PS31 Euro4 on MONSooN	UM Model	8.2	help	willie	new	21/06/13
#1087	Ensembles on MONSooN	UM Model	8.2	help	willie	new	21/06/13
#1081	Unknown problem in .leave file when submitting job	UM Model	6.6.3	help	um_support	new	11/06/13
#1071	UKCA O3-NOy daily output run failed	UM Model	7.3	help	luke	accepted	20/05/13
#1070	running HadCEM at Bristol	UM Model	4.5	help	jeff	new	16/05/13
#1067	Failure of model run using IAU scheme - segmentation fault	UM Model	6.6.3	help	um_support	assigned	13/05/13
#1064	Sporadic problems submitting to MONSOON (error msg: "system has no more ptys"	UM Model	7.3	help	um_support	new	07/05/13
#1061	segmentation fault when running HadCEM	UM Model	4.5	error	um_support	new	03/05/13
#1059	ssh_exchange_identification: Connection closed by remote host	UM Model	<select version=""></select>	help	um_support	new	01/05/13
#1053	Model instability	UM Model	7.3	help	luke	accepted	15/04/13
#1051	UKCA NOy stash diagnostics&NOx emissions	UM Model	7.3	help	luke	accepted	10/04/13
#1035	xancil - error	UM Model	6.1	help	jeff	accepted	08/03/13
#988	Network timeout submitting jobs to MONSooN	MONSooN	7.3	error	ros	reopened	06/12/12
#981	Sea ice ancillary file causing model crash	UM Model	7.3	help	jeff	accepted	03/12/12
#892	Error when reconfiguring a minimal start dump without physics	UM Model	8.2	help	annette	reopened	16/08/12
#769	Error when attempting to run an ensemble	UM Model	7.8	error	simon	assigned	10/01/12
#648	UM version 4.5.3 (FAMOUS) compilation problem	FAMOUS	4.5	error	robin	accepted	11/07/11
#583	12-hour and 6-hour means	UMUI	<select version=""></select>	help	lois	assigned	16/02/11



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Helpdesk

#1042 close	Opened 4	Opened 4 months ago		
fcm conflict -	skipped unhandled tr	ee conflict	Closed 3 n	nonths ago
Reported by:	luke	Owned by:	ros	
Priority:	normal	Component:	FCM	
Keywords:	merge, conflict			
Platform:	PUMA	UM Version:	7.3	
Description I'm trying to merg copied by doing a code in correctly,	ge in two branches, both of w fcm merge rather than a b but am having the following	which are based on the sam ranch-of-branch. I believe error:	e original branch, and were that I have merged all the	e 🕒 Reply
[12:45:55 1 /home/luke/I [ERROR] File C [FAIL] Fcm:	uke@puma src]\$ fcm commit FCM/VN7.3/vn7.3_UKCA_CheM e(s) in conflicts: 11386 src/utility/net :Cm::Abort: abort	t 4_vnl.l.l: working dire ccdf_utils	ctory changed to top of	worki

Exit 255

When I run fcm conflicts I get the following message

[12:44:27 luke@puma netcdf_utils]\$ fcm conflicts
[WARN] src/utility/netcdf_utils: skipped unhandled tree conflict.

How can I resolve the conflict and commit these changes. I'm not actually sure there are any changes in the src/utility/netcdf_utils directory either.

Thanks,

Luke

Solved in 5 comments

The Helpdesk is searchable, so if you have a problem the first thing to do is to search for past tickets with the same problem.

If you cannot find a solution open a new ticket. This will be emailed round to all of the CMS team

UKCA tickets will be answered by me.



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- The UKCA Tutorials are being developed as part of the ACITES atmospheric chemistry modelling network
 - The tutorials focusing on chemistry are complete, and the tutorials focusing on aerosols will be completed within the next few weeks.

• Premise:

What are the most common things that a PhD student or Research Associate will need to know how to do when they start using UKCA?







Starting to use UKCA

- Often you will want to use UKCA to answer questions like these:
 - What happens when I add in reaction A to form new species B?
 - What is the effect of changing the emissions of C?
 - How does the deposition of D affect process E?
 - How do my changes affect the aerosol properties?
 - What is the budget of F?
 - Output the fluxes of reactions G, H, and I to diagnose it.
- When you have completed the UKCA Tutorials you should have a basic understanding how to make the required changes needed to answer these questions





• Through-out the tutorial you are asked to perform a series of tasks. In fact, these are part of one big task which is:

Create two new species, ALICE and BOB, then add in emissions of ALICE and the reaction

ALICE + OH → BOB + Secondary Organic Compound (Sec_Org)

before adding in the dry deposition of ALICE and the wet deposition of BOB. You should also output the fluxes through the reaction and deposition processes. You will then make changes to the GLOMAP-mode aerosol scheme and diagnose the impact of this reaction on the aerosol microphysics.



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- Despite seeming to be straight-forward, this is actually quite a big task as it involves
 - UMUI changes
 - Creation of hand-edits
 - Creation of STASHmaster (diagnostic definition) files
 - Changes to STASH (diagnostic) output
 - UKCA code changes
 - New species
 - New emissions
 - New reactions/depositions
 - Changing the aerosol configuration
 - Creating of new input files
 - Regridding input data







- When working with UKCA it is important to
 - 1. Break the tasks down into manageable chunks
 - This is why the task is split across several tutorials

- 2. Remember that UKCA sits within the UM framework
 - When making changes to UKCA that will also involve changes to the UM, you should (where possible) make the UM changes *first*
 - If the UKCA changes are made first you will probably not be able to compile or run, but making the UM changes first means that you can check that the infrastructure is in place for the changes you will make to UKCA





- The Tutorials are broken down into three sections
 - 1. General use of UKCA and the UMUI
 - These three tutorials cover the basics of the UMUI, copying and running a UKCA job, and STASH
 - 2. UKCA Chemistry
 - These tutorials break down the chemistry task into 6 smaller chunks
 - Adding tracers, adding emissions, adding reactions, adding dry and wet deposition, and adding diagnostics
 - 3. UKCA Aerosols
 - The 3 aerosol tutorials cover changing the aerosol configuration, looking into how your changes have affected the aerosol optical depth, and diagnosing the radiative effect of aerosols





• These tutorials have been designed so that you can go through them in your own pace and in your own time

• This is partly because, due to the number of steps that may need to be completed, it may take longer than 2 days to complete all the tutorials

 Do not worry if you are not able to complete a section – you can pick-up a worked solution and carry on from there





Feedback

I hope that you will find the UKCA Tutorials both enjoyable and useful.

It would be very helpful for me if you could fill in the UKCA feedback form which is linked to from the Tutorial front page.

More detailed comments can be emailed to me at

luke.abraham@atm.ch.cam.ac.uk

Any and all feedback given will be used to improve the Tutorials for future users.





The Tutorials



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Tutorial 1: Running an existing UKCA job



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Tutorial 1: Running an existing UKCA job

- This tutorial is designed to make you more familiar with the use of Xconv to view UKCA output, and to convert the UM fields-file format to netCDF
- It also covers the text-file output the .leave files
 - If your job has an error, either in the compilation step or the run-step, then you may get useful information in these files
 - During run-time, further information is also held in the jobid.fort6.peX files
- In this tutorial you are asked to run your copy of the Tutorial base job, and examine the output

ARCHER: xjrna





Tutorial 1: Running an existing UKCA job

You should now work through the

Running an existing UKCA job

tutorial



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Tutorial 1: Running an existing UKCA job

- Points to remember
 - 1. You can check the progress of a running job by looking at the output in the jobid.fort6.peX files
 - 2. Xconv can be used to take a quick look at UM/UKCA output, as well as converting this output to other formats, e.g. netCDF
 - 3. Warning and error messages are held in the output .leave files







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- This task is designed to make you more familiar with the UMUI
- On many levels, the having the functionality given by the UMUI is a big plus for the UM
 - It provides a well organised method of editing the very complex scripts used to run the UM
 - It provides a certain level of consistency checking
 - Most UMUI panels have some level of help text available





- However, the UMUI is currently not searchable
 - This tutorial was designed to provide a useful point of reference for many of the UMUI panels that you may need to use when using UKCA
 - You may also find it useful to make your own notes as to what each panel does

• In this tutorial you are asked to browse through the UMUI panels







You should now work through the

Exploring the UMUI





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- Points to remember
 - The UMUI is a very useful way to manage UM/UKCA jobs, however, it has no search function and so it can be quite difficult to find exactly what you want
 - 2. Remember that there may be help text available for a panel
 - 3. If you are unsure what you are looking for, browse through the UMUI panels, and make changes to see which options appear. However, you should remember to **abandon** any unwanted changes rather than close (and save) the panel
 - 4. You may find it useful to make notes about which panels do what.





Tutorial 3: STASH



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Tutorial 3: STASH

- This tutorial is designed to give you an overview of the STASH panel and options
- Some further details to do with STASH, such as making new STASH specification files, are covered in later tutorials
- You are also asked to add some high-frequency output and check that this is being done correctly



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Tutorial 3: STASH

You should now work through the

What is STASH?





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Tutorial 3: STASH

- From this tutorial I hope that you have more of an understanding of what STASH can and can't do, as well as things to try if you are having problems
- Points to remember
 - 1. If you are unsure the best thing to do is to **take a copy of your job** and play around with settings until you get the desired effect
 - You can always **abandon** any unwanted changes
 - 2. Remember to **verify** your diagnostics after any changes, as this will flag any issues







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- This tutorial begins the process of adding in the new tracers, emission, reaction, depositions, and diagnostics
- It also requires you to make a new FCM branch and merge-in an existing UKCA branch
 - While a lot of UKCA developments were put back into the trunk at UM8.2, you may still find that you need to do this merging step, and it is useful to know how to do this
 - If you want to use another UM/UKCA version (e.g. UM7.3) then you will need to know how do this
- You are asked to add in two tracers, ALICE and BOB
 - This task is a good example of needing to add in the UM/UMUI changes **first**, before making any changes to the UKCA code itself



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You should now work through the

Adding new chemical tracers





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- Points to remember for the UM/UMUI changes:
 - 1. Pick your tracer slot(s) from the UKCA code
 - 2. Make a STASHmaster file for these, and add them to the UMUI
 - Remember to initialise the tracer as well as output it
 - 3. Make your hand-edit to turn on these slots

• Once you have done these, you can make your UKCA changes







- Points to remember for the UKCA changes:
 - 1. The number of tracers UKCA thinks it has will be different from the number of tracers the UM/UMUI thinks UKCA has
 - The UM/UMUI is concerned with how many tracers are transported in section 34
 - UKCA is concerned with how many species, which are involved in the chemical mechanism, are transported
 - This means that the UKCA diagnostic tracers, e.g. age of air appear in the UM/UMUI but not the UKCA species list, and H2O appears in the UKCA species list but not the UM/UMUI (as it is not transported in section 34).
 - 2. As the UM outputs tracers in mass-mixing ratio, but UKCA performs the chemistry in volume-mixing ratio, you will need to define a conversion factor for your new tracers







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- In this tutorial you are taught about
 - How to regrid emissions to the correct UM grid using Xconv
 - How to use Xancil to produce a new emissions file
 - How to make the necessary changes to UKCA

 You are asked to take an emissions dataset for ALICE and regrid it to N96 resolution, then make up a new ancillary file and then use this in UKCA



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Adding new emissions

tutorial



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0.5x05



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ENT RESEARCH COUNCIL



N96 1.25x1.875



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INT RESEARCH COUNCIL







- Points to remember:
 - 1. You should always regrid your emissions using **area-weighted** interpolation to ensure that the same mass is emitted at the new resolution
 - 2. The UM/UMUI can only read-in one single-level (and one multilevel) emissions user ancillary file, so you must also include all the other emissions already in use in your new emissions file
 - 3. In UKCA you will need to specify the STASH number of these emissions
 - 4. You will also need to define the molar mass of the species being emitted into







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- In this tutorial you are taught about
 - The different types of reactions UKCA considers
 - a) Bimolecular reactions
 - b) Termolecular reactions
 - c) Heterogeneous reactions
 - d) Photolysis reactions
 - The format of how these reactions are defined within the UKCA chemistry scheme specification module are very similar
 - However, special code may need to be added for some reactions



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• In this tutorial you are asked to add the following bimolecular reaction

ALICE + OH → BOB + Secondary Organic Compound (Sec_Org)

using the following rate coefficients $k_0 = 2.70 \times 10^{-11}$ $\alpha = 0.00$ You should: $\beta = -390.0$

• Make your changes to the UKCA chemistry specification module and change the number of reactions using a hand-edit

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You should now work through the

Adding new chemical reactions

tutorial



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- Points to remember
 - 1. Check that you have your array sizes correct it can be difficult to keep track
 - 2. As well as increasing the number of (e.g.) bimolecular reactions you will also need to increment the total number of reactions



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- There are two dry deposition schemes that UKCA uses
 - 1. A simple 2-dimensional scheme
 - 2. An interactive parameterisation, based on the Wesely scheme, which deposits from throughout the boundary layer

- The 2D scheme only requires changes to the UKCA chemistry scheme specification module, as well as a hand-edit
- The Interactive scheme also requires changes to two UKCA routines
 - You may also need to define the molar mass of the dry deposited species





- In this tutorial you are asked to add-in the dry deposition of ALICE (which deposits in the same in the same way as CO)
- The values for the 2D scheme are

	Summer (day)	Summer (night)	Summer (24h av)	Winter (day)	Winter (night)	Winter (24h av)
Water	0.0	0.0	0.0	0.0	0.0	0.0
Forest	0.3	0.3	0.3	0.3	0.3	0.3
Grass	0.3	0.3	0.3	0.3	0.3	0.3
Desert	0.3	0.3	0.3	0.3	0.3	0.3
lce	0.0	0.0	0.0	0.0	0.0	0.0

 The values for the interactive scheme should be taken from how CO is treated in ukca_aerod and ukca_surfddr, taking the different molecular mass of ALICE into account





You should now work through the

Adding dry deposition of chemical species

tutorial



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- Points to remember
 - 1. Even if you are using the Interactive scheme, you will also need to make changes to the 2D scheme
 - The order of values in the 2D scheme depvel_defs array is important – you should ensure that this matches the order of the species in the chch_defs array
 - You may need to re-order your tracer list here
 - 3. When adding species to the Interactive scheme you may also need to define the molar mass of the deposited species





Tutorial 8: Adding wet deposition



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Tutorial 8: Adding wet deposition

- There is only one wet deposition scheme used in UKCA
- You will need to define the Henry's Law coefficients for each species that is wet deposited
- To add in new wet deposition you will only need to make changes to the • chemistry scheme specification module, as well as a hand-edit

In this tutorial you are asked to add-in wet deposition of BOB using the following values

$$k(298) = 0.21 \times 10^{6}$$

-($\Delta H/R$) = 0.87 × 10⁴
$$k(298)_{1stDissociation} = 0.2 \times 10^{2}$$

-($\Delta H/R$)_{1stDissociation} = 0.0
$$k(298)_{2ndDissociation} = 0.0$$

-($\Delta H/R$)_{2ndDissociation} = 0.0





Tutorial 8: Adding wet deposition

You should now work through the

Adding wet deposition of chemical species

tutorial



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Tutorial 8: Adding wet deposition

- Points to remember
 - The order of the henry_defs array is important, and (as with the 2D dry deposition scheme) should match the order of species in the chch_defs array



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- While the STASH system provides a nice GUI system for requesting output, it does introduce complexity within the code (and in the user-STASHmaster file format)
- UKCA has a diagnostic system which deals with the STASH-handling, meaning that it is straight-forward to add-in new diagnostic requests
 - The code which deals with the diagnostics is in asad_chem_flux_diags
 - You should not need to edit this module unless you want to make a new type of diagnostic
 - The specification of the diagnostics is done in the **asad_flux_dat** module





- Currently UKCA can output the following types of diagnostics
 - The flux through, or rate of, chemical reactions
 - The flux through deposition processes
 - Emission fluxes, both surface (2D) and 3D (e.g. lightning, aircraft etc.)
 - The net chemical and dynamical tendencies of tracers
 - The atmospheric mass
 - PSC diagnostic information
 - A dynamic 'tropospheric mask', useful for post-processing
 - Tracer concentrations (which can be masked to only include tropospheric values)
- Most diagnostics have units of moles/gridcell/s





• 2D user-STASHmaster file diagnostic specification



• 3D user-STASHmaster file diagnostic specification





- To add new diagnostics you will need to
 - 1. Define your diagnostic request in the **asad_flux_dat** module
 - 2. Create a new user-STASHmaster file for this diagnostic
 - Care should be taken if the diagnostic is 2D or 3D
 - 3. Request this diagnostic in the UMUI STASH panel
 - Care should be taken about the sampling time, as the UKCA chemistry timestep is one hour
- You can also use this diagnostic system to sum diagnostics on-line
 - Multiple diagnostics sent to the same STASH code will be summed (useful for budgeting)





- In this tutorial you are asked to
 - 1. output the flux through the

ALICE + OH → BOB + Secondary Organic Compound (Sec_Org) reaction to STASH code 34461

- 2. Output the dry deposition of ALICE to STASH code 34462
- 3. Output the wet deposition of BOB to STASH code 34463

These should be daily means to the **pa/UPA** output stream.





You should now work through the

Adding new UKCA diagnostics

tutorial



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- Points to remember
 - 1. When requesting these new diagnostics in STASH, you should be careful of the time sampling used
 - The UKCA chemical timestep is only every hour, so reaction and deposition fluxes are only valid on these timesteps
 - 2. Be careful which STASH numbers you choose
 - The UKCA diagnostics are configured to sum multiple diagnostics to a single STASH number if defined this way
 - If you are unsure if you should use a 2D or 3D user-STASHmaster file specification for your new diagnostic(s), you can always use a 3D one





What should you now be able to do with UKCA?

- After doing these tutorials you should
 - Be more confident using the UMUI
 - Be able to copy an existing UKCA, run it, and be able to process the output
 - Be familiar with STASH
 - Be able to add new UKCA tracers
 - Be able to create and add emissions into UKCA
 - Be able to define new chemical reactions
 - Be able to define new dry and wet deposition of species
 - Be able to output new UKCA diagnostics
 - Be able to change the aerosol configuration
 - Be able to examine the aerosol optical depth
 - Be able to diagnose the radiative effect of aerosols





Feedback

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What is STASH?

 STASH is the Unified Model's Storage Handling and Diagnostic System ("Spatial and Temporal Averaging and Storage Handling")

UNIFIED MODEL DOCUMENTATION PAPER NO C4

STORAGE HANDLING AND DIAGNOSTIC SYSTEM (STASH)

- It is designed to cope with the many different configurations that the UM can be used in, but still provide output in a consistent and standard way
- The basic building block of STASH is the *horizontal* field
 - It uniquely labels prognostic, ancillary, and diagnostic fields
- Calls to STASH are made every timestep to allow it to extract, process, and output data



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Model Sections





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STASH Sections







STASH sections, STASH items

- While it is easy to make variables within the UM, if you want to output this variable cleanly, it must be defined within STASH.
- Each STASH code is made up of 5 numbers, giving the address of the prognostic or diagnostic within the model.
 - The first two numbers are the **section**
 - The last three numbers are the item
 - There can only be **512 items** per section
- e.g.
 - UKCA N2O has STASH code 34049
 - Specific humidity has STASH code 10 (00010 = section 00, item 010)



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Prognostics

- Prognostic variables are those that the code requires to derive all other quantities
 - e.g. u, v, q etc.
 - tracers are also prognostic quantities

Prognostics are outputted in UM dump files (jobida.da*)

• In the code these prognostics are held within a master array called **D1**



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Diagnostics

- Diagnostics are all variables which are not prognostics (i.e. the model does not need these to restart, since it can calculate these from prognostic variables)
 - e.g. pressure on model levels, UKCA reaction fluxes etc
- Diagnostics are not held within **D1**, they are copied into STASH directly
- In the code this is done with a call to **copydiag** to put the diagnostic into the **STASHwork** array, before it is passed via a call to STASH
- For most UKCA diagnostics, these steps are already done for you using the asad_chem_flux_diags module



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STASH treatment of variables

- The STASH system also provides a GUI in the UMUI for managing all model output
- Diagnostic and prognostic variables are treated equally when outputting to data files
- There is a high level of control over:
 - The time domain the variables are sampled and processed over
 - The spatial domain the variables are sampled and processed over
- The variables can output through different output streams (fields-files or 'PP files') or passed through to the climate meaning stream





pre-STASHmaster files

- If STASH sections are analogous to streets in a city, then STASH items are analogous to houses on each street
- In order to output the variable correctly then you need to get the address right
- This is done with the use of a pre-STASHmaster file
 - This defines the STASH section and item numbers, the levels it is valid for, if it is a prognostic or not, and many others
 - It can also be used to remove unwanted variables from a model dump
 - A full description can be found in UMDP C4 (ask me for a copy or see the collaboration Twiki)



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#					
1	1 34 7 HONO2 MASS MIXI	NG RATIO AFTER TSTEP			
2	2 0 1 2	10 11 0	0	0	0
3	000000000000000000000000000000000000000	000000000000000000000000000000000000000	1		
4	1 0 -99 -99 -99 -99 -	99 -99 -99 -99 -99	-99		
5	0 1861 1 65 0	0 0 0	0		
#					
1	1 34 483 NOY: DRY DEP OF	NO (2D)			
2	0 0 1 5	-1 -1 0	0	0	0
3	000000000000000000000000000000000000000	000000000000000000000000000000000000000	3		
4	1 0 -99 -99 -99 -99 -	99 -99 -99 -99 -99	-99		
5	0 1871 1 129 0	0 0 0	0		
#					
1	1 34 489 NOY: WET DEP OF	NO3			
2	0 0 1 2	10 11 0	0	0	0
3	000000000000000000000000000000000000000	000000000000000000000000000000000000000	3		
4	1 0 -99 -99 -99 -99 -	99 -99 -99 -99 -99	-99		
5	0 1871 1 65 0	0 0 0	0		
#			-		

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#					
1	1 34 7 HONO2 MASS MIXING RATIO AFTER TST	'EP			
2	2 0 1 1 2 10 11 0		0	0	0
3	0000000000000000000000000000000000000	.	1		
4	1 0 -99 -99 -99 -99 -99 -99 -99 -99 -99	-99	-99		
5	0 1861 1 65 0 0 0 0		0		
#					
1	1 34 483 NOY: DRY DEP OF NO (2	D)			
2			0	0	0
3	000000000000000000000000000 00000000	.	3		
4	1 0 -99 -99 -99 -99 -99 -99 -99 -99 -99	-99	-99		
5	0 1871 1 129 0 0 0 0		0		
#					
1	1 34 489 NOY: WET DEP OF NO3				
2	0 0 1 1 1 2 10 11 0		0	0	0
3	000000000000000000000000000 00000000	.	3		
4	1 0 -99 -99 -99 -99 -99 -99 -99 -99 -99	-99	-99		
5	0 1871 1 65 0 0 0 0)	0		
#					

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#				
1	1 34 7 HONO2 MASS MIXING RATIO AFTER TSTEP			
2	2 0 1 1 1 2 10 11 0	0	0	0
3	000000000000000000000000000000000000000	1		
4	1 0 -99 -99 -99 -99 -99 -99 -99 -99 -99 -	-99		
5	0 1861 1 65 0 0 0 0	0		
#				
1	1 34 483 NOY: DRY DEP OF NO (2D)			
2	0 0 1 1 5 -1 0	0	0	0
3		3	·	
4	1 0 -99 -99 -99 -99 -99 -99 -99 -99 -99 -	-99		
5	0 1871 1 129 0 0 0 0	0		
#				
1	1 34 489 NOY: WET DEP OF NO3			
2	0 0 1 1 2 10 11 0	0	0	0
3		3	·	
4		-99		
5	0 1871 1 65 0 0 0 0	0		
#				

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#					
1	1 34 7 HONO2 MASS M	IXING RATIO AFTER TSTEP			
2	2 0 1 2	10 11 0	0	0	0
3	000000000000000000000000000000000000000	000000000000000000000000000000000000000	1		
4	1 0 -99 -99 -99 -99	-99 -99 -99 -99 -99	-99		
5	0 1861 1 65 0	0 0 0	0		
#					
1	1 34 483 NOY: DRY DEF	OF NO (2D)			
2	0 0 1 5	-1 -1 0	0	0	0
3	000000000000000000000000000000000000000	000000000000000000000000000000000000000	3		
4	1 0 -99 -99 -99 -99	-99 -99 -99 -99 -99	-99		
5	0 1871 1 <mark>129</mark> 0		0		
#					
1	1 34 489 NOy: WET DEF	OF NO3			
2	0 0 1 1 2	10 11 0	0	0	0
3	000000000000000000000000000000000000000	000000000000000000000000000000000000000	3		
4	1 0 -99 -99 -99 -99	-99 -99 -99 -99 -99	-99		
5	0 1871 1 65 0		0		
#					

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Removing a field from a UM dump

# 1 1 2 2 3 0000 4 1 5 0 #	0 0 00000000000 0 539	309 C5H8 s 1 1 00000000000000 -99 -99 -9 0 129	urf emissi 5 0000 000 9 -99 -9 0	ons -1 00000000 9 -99 0	-1 0 0000000001 -99 -99 0 0	 _999	0 3 -99 0	0	0
# 1 1 2 10 3 0000 4 1 5 0 #	0 0 00000000000 0 539	309 C5H8 s 1 1 00000000000000 -99 -99 -9 0 129	urf emissi 5 0000 000 9 -99 -9 0	ons -1 00000000 9 -99 0	-1 0 0000000001 -99 -99 0 0	 _999	0 3 -99 0	0	0





```
H1
   SUBMODEL NUMBER=1
H2
   SUBMODEL NAME=ATMOS
H3
   UM VERSION=7.3
#
# Model
       Sectn
               Item
                    Name
                     Grid |LevelT|LevelF|LevelL|PseudT|PseudF|PseudL|LevCom|
#
 Space
       Point
               Time
  Option Codes
                       Version Mask
                                           Halo
#
#|DataT |DumpP
               PC1
                    PC2
                       PC3 PC4 PC5 PC6
                                           PC7
                                               PC8
                                                   PC9 PCA
 Rotate PPFC
               USER
                     LBVC
                            BLEV
                                  TLEV | RBLEVV | CFLL
#
                                                      CFFF
#
1
           34
                512
                     NEW DIAGNOSTIC
2
                               2
                                    10
                                                               0
                         1
                                           11
                                                  0
                                                         0
                                                                     0
  3
                                                         3
               -99
                    -99
                        -99
                             -99 -99 -99
                                           -99
                                               -99 -99
                                                         -99
4
     1
            0
5
         1871
                       65
                               0
                                            0
                                     0
     0
                  1
                                                  0
                                                         0
#
1
                     END OF FILE MARK
    -1
                 -1
2
                                                               0
                                                                     0
                               0
                                     0
                                            0
                                                  0
                                                         0
     0
                         0
3
  0
                    -99
                        -99
                             -99
                                  -30
                                      -99
                                           -99
                                               -99
                                                    -99
4
     0
               -99
                                                         -99
            0
                               0
                                            0
5
                  0
                        0
                                     0
                                                  0
     0
            0
                                                         0
#
```





 Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling FCM Configuration 	CA-TropIsop HECToR PF STASH. Specificatio STASH related choir User-STASHmaster 1 Initialisation of User	hase2b on of Dia ces files. Dia Prognos	N48L60 QESM-A" gnostic requirements tigs, Progs & Ancills. tics pecify User STASHmaster files : Job xhkp.a: "UKCA-TropIsop HEC	ToR Phase2b	1 0					
	ī	No.	Specify Local File		Δ					
Independent Section Options Bast Processing	Ē	1	~ros/HadGEM3-A/vn7.3/HGPKG1/um71_ticket1552							
Atmosphere	1	2	~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_lsh_agwjb							
Model Resolution and Domain	:	3	~annette/hadgem3/preSTASHmaster/sea_ice_temp							
- Model Configuration	4	4	~ukca/userprestash/parinsec0							
Data assimilation and temporal filtering	:	5	~ukca/userprestash/VN7.3/r1.0/s0_CheM_STASH_emissions_v7.3							
-C Ancillary and input data files	1	6	~ukca/userprestash/VN7.3/r1.0/s34_CheM_STASH_151-172_v7.3							
-C STASH	;	7	~ukca/userprestash/VN7.3/r1.0/s34_CheM_STASH_fluxes2D_v7.3							
STASH macros	1	8	~ukca/userprestash/VN7.3/r1.0/s34_CheT_STASH_tracers_v7.3							
	:	9	~luke/STASHmaster/new_field							
		10		7						
	i i	Inert	Edit							
			Sort							
Help Check Setup Save Process Submit You are advised to visit the Prognostics follow-on window every time you change the above table or change a file in the table										
	_ Extend	ling le	vel or pseudo level code definitions.							
	Note. This	s will o	inly work with modifications at this release.							
	Set codes	s that a	are not required to zero. See help.							



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	New level code.	
Code	Define level for code.	
1		$\overline{\Delta}$
2		

💿 🔿 💿 🔣 umui application. Navigation of Job xhkp.a:	UKCA-Tro	plsop HECToR Phase2b N48L60 QESM-A"			
 Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling FCM Configuration Compilation and Modifications Reconfiguration Independent Section Options Post Processing Atmosphere 	All user-p	TASH. Specification of Diagnostic requirements TASH related choices ser-STASHmaster files. Diags, Progs & Ancills. Itialisation of User Prognostics Spectorognostic fields must be initialised by the reconfiguration is on re, you have specified that the reconfiguration is on	ification of I	User Prognostics : Jo	b xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L
Hodel Resolution and Domain				Spe	cify Initialisation Option
— Model Configuration	Item	NAME	Option	If 6: CONSTANT	IF 7: NAMED FILE ON TARGET MACHINE
Scientific Parameters and Sections	34083	MeOO MASS MIXING RATIO AFTER TIMES	7		/work/n02/n02/ukca/ANCILS/QESM/CheT_init.anc
Data assimilation and temporal filtering Ancillary and input data files	34084	Etoo MASS MIXING RATIO AFTER TSTEP	7		/work/n02/n02/ukca/ANCILS/QESM/CheT_init.anc
	34085	MeCO3 MAS MIXING RATIO AFTER TSTEP	7		/work/n02/n02/ukca/ANCILS/QESM/CheT_init.anc
	34086	In-Proo MAS MIXING RATIO AFTER TSTEP	/		/work/nUZ/nUZ/ukca/ANCILS/QESM/CheT_init.anc
	34087	FPROD MAS MIXING RATIO AFTER ISTEP	1		/work/nUZ/nUZ/ukca/ANCILS/QESM/CheT_init.anc
	34088	EtCO3 MAS MIXING RATIO AFTER ISTEP	/		/work/nu2/nu2/ukca/ANCILS/QESM/CheT_init.anc
	34089	MeCUCH2UU MMR AFTER TSTEP	1		/work/nu2/nu2/ukca/ANCILS/QESM/CheT_init.anc
	34090	ISUZ MASS MIXING RATIO AFTER ISTEP	1		/work/nu2/nu2/ukca/ANCILS/QESM/CheT_init.anc
	24005	MOOH MASS MIXING RATIO AFTER ISTEP	7		work/h02/h02/ukca/ANCILS/QESM/CheT_init.anc
	24150	ACE OF AID IN SECONDS	2		workmozmoznukca/ANCIES/GESM/CheT_init.anc
	24512	NEW DIACNOSTIC	J		
	104012				
Help Check Setup Save Process	men	jinen	j Edit	j Edit	
	Valid opt 1 Initi 2 Initi 3 Set 4 Set 5 Initi	ion codes are: alise from the field in the START dump. alise from User Ancillary File (special item numbers to Zero. to missing data. alise Tracer data from a Tracer File.	no longer re	quired).	
	6 Set	to a specified constant value. Specify a real numb	er, it will be c	onverted to an integer	if required.
UNIVERSITY OF	7 Initi Gi	alise from a single-time field on a named file (in and ive the full pathname of a file on the target machine	illary file forn	nat)	
CAMIDAIL	Push RE	CON to specify the reconfiguration options			

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lication. Navigation of and Target Machine ntrol and Resources figurations and Coupling ion Modifications	Job xhkp.a: "UKCA-TropIsop HECTOR Phase2b N48L60 QESM-A" STASH. Specification of Diagnostic requirements STASH related choices User-STASHmaster files. Diags, Progs & Ancills. Initialisation of User Prognostics						
Inert	Inert	Edit	Edit				
Valid optio 1 Initia 2 Initia	on codes are: dise from the field in the START dump. dise from User Ancillary File (special item numbers no	o longer requ	ired).				
3 Sett 4 Sett	to Zero. to missing data.	5 1	,				
5 Initia	nitialise Tracer data from a Tracer File.						
6 Sett	to a specified constant value. Specify a real number,	it will be con	verted to an integer				
7 Initia	dise from a single-time field on a named file (in ancilla	ary file format)				
	A and Target Machine ntrol and Resources ingurations and Coupling ion Modifications Valid option Valid option Valid option 1 Initia 3 Set 1 4 Set 1 5 Initia 6 Set 1 7 Initia	Alication. Navigation of Job xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A" and Target Machine Introl and Resources Ingurations and Coupling Intert STASH related choices User-STASHmaster flies. Diags, Progs & Ancills. Initialises from User Prognostics Additional Coupling Initialise from the field in the START dump. Valid option codes are: Initialise from User Ancillary File (special item numbers no Set to Zero. Set to Zero. Set to missing data. Initialise Tracer data from a Tracer File. Set to a specified constant value. Specify a real number, Initialise from a single-time field on a named file (in ancilla)	Initialise from User Ancillary File (special item numbers no longer requi 3 Set to Zero. 4 Set to missing data. 5 Initialise Tracer data from a Tracer File. 6 Set to a specified constant value. Specify a real number, it will be con 7 Initialise from a single-time field on a named file (in ancillary file format				

Give the full pathname of a file on the target machine.





Model Selection Model Selection User Information an Input/Output Contro Sub-Model Configu FCM Configuration Compilation and Mo	ation. Navigation o d Target Machine I and Resources rations and Coupling odifications	Job xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"		
Reconfiguration Independent Sectio	34512	NEW DIAGNOSTIC	3	
└── Post Processing └── Atmosphere └── Model Resolutio	Inert	Inert	Edit	Edit
Help	Valid opt 1 Initi 2 Initi 3 Set 4 Set 5 Initi 6 Set	ion codes are: alise from the field in the START dump. alise from User Ancillary File (special item numbe to Zero. to missing data. alise Tracer data from a Tracer File. to a specified constant value. Specify a real num	rs no longer requ ber, it will be cor	ired). iverted to an integer
	Gi	we the full pathname of a file on the target machin	nemary nie formai 1e.	9





🔿 🔿 🔯 umui application. Navigation of Job xhkp.a: "UKCA	-TropIsop HECToR Phase2b N48L60 QESM-A"	
 Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling FCM Configuration Compilation and Modifications 	STASH. Specification of Diagnostic requirements STASH related choices User-STASHmaster files. Diags, Progs & Ancills. Initialisation of User Prognostics	
- Reconfiguration	Warnings for user diagnostics	
Independent Section Options	The following user diagnostics have overwritten system diagnostics:	
	If you change the user diagnostics/prognostics while editing this job, you will need to reload	
Honore Resolution and Domain	the stash master list in the stash window for the changes to take effect. The complete stash master	
Model Configuration	list is usually only loaded once during each job edit when the stash window is first entered.	
C Scientific Parameters and Sections	/1.0.27/I) from proSTASH file: "rec/HodGEM3_A/up7_3/HGEV/C1/stochmoster_lich_activity"	
— 🗋 Data assimilation and temporal filtering	(1,0,275) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_ish_agwjb"	
-C Ancillary and input data files	(1,0,276) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_lsh_agwjb"	
-C STASH	(1,0,277) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_Ish_agwjb"	
STASH macros	(1,0,278) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_lsh_agwjb"	
Control	(1,U,Z/9) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_ish_agwjb" (1,0,280) from preSTASH file: "-ros/HadGEM3 A/up7.3/HGPKG1/stashmaster_ish_agwjb"	
- 🗋 NEMO	(1,0,200) from prestrash file: -ros/HadGEM3-A/vr7.3/HGPKG//stashmaster_isi_agwjb (1,0,281) from prestrash file: -ros/HadGEM3-A/vr7.3/HGPKG//stashmaster_isi_agwjb"	
	(1,0,282) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_lsh_agwjb"	
	(1,0,283) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_Ish_agwjb"	
	(1,0,284) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_lsh_agwjb"	
	(1,0,285) from preSTASH file: "~ros/HadGEM3-A/vn7.3/HGPKG1/stashmaster_lsh_agwjb" (1,0,40) from preSTASH file: " another to down 2/for STASH to the start of a torus"	
	(1,0,43) from prestAsH file: ~anneue/nadgemorprestAsHmaster/sea_ice_temp (1,0,480) from prestAsH file: "withcalveeringtash/haringee/0"	
∇	(1.34.151) from preSTASH file: "-ukca/userprestash/VN7.3/1.0/s34 CheM STASH 151-172 v7.3"	
	(1,34,152) from preSTASH file: "~ukca/userprestash/VN7.3/r1.0/s34_CheM_STASH_151-172_v7.3"	
<u>H</u> elp <u>Check Setup</u> <u>Save</u> rocess Su <u>b</u> mit	(1,34,153) from preSTASH file: "~ukca/userprestash/VN7.3/r1.0/s34_CheM_STASH_151-172_v7.3"	
Building window	(1,34,154) from preSTASH file: "~ukca/userprestash/VN7.3/r1.0/s34_CheM_STASH_151-172_v7.3"	
Parally million	(1,34,155) from prestASH file: "~ukca/userprestash/VN7.3/11.0/S34_CheM_STASH_151-172_V7.3" (1.34,156) from preSTASH file: "~ukca/userprestash/VN7.3/11.0/S34_CheM_STASH_151-172_V7.3"	
	Continue	
		V.





🔀 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	ТЗНММ	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

Usage Profiles available

UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
--------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--

STASH												
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System		
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	$\overline{\Delta}$	
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM		
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM		
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM		
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM		
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	ТЗНММ	DIAG	UPD	Y	+K	Y		SYSTEM		
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM		
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM		
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM		
0	25	BOUNDARY LAYER DEPTH AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇	
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert		
🔀 STASH Panel ATMOS. Experiment xhkp, Job a

stash	Profiles	Diagnostics Help									
	Time Prof										
	TDMPMN	Load New Diagnostics	(Control-1)	2	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
	TMONMN	Remove Diagnostic	(Control-r)	CA			<u> </u>				
ŀ		Clone Diagnostic	(Control-c)	⊢			<u> </u>			<u> </u>	
Í		Output Table to File									
		Set Package Switches	(Control-t)								
	Domain F	Clear Table					1				
	DIAG	Verify Diamostics	(Control-v)		DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
	DTILE	Re-check Availability	(000010101),	╞	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
ſ		Sort Diagnostics									
l D	Usage Pr	Change Sort Order				LUDD.	lups	LUDU .			
	UPMEAN	الالمان المستحد متعاشيا التنقيل	<u>1</u> ar a		טייטן	ръв	UPE	јорн	ואטן	JOPJ	

			STAS	н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	$\overline{\Delta}$
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	ТЗНММ	DIAG	UPD	Y	+K	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	
0	25	BOUNDARY LAYER DEPTH AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	7
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

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Cancel

Diagnostics Help	
Load New Diagnostics	(Control-1)
Remove Diagnostic	(Control-r)
Clone Diagnostic	(Control-c)
Output Table to File	
Set Package Switches	(Control-t)
Clear Table	
Verify Diagnostics	(Control-v)
Re-check Availability	
Sort Diagnostics	
Change Sort Order	
	······

Section Number	Section Name	
12	Primary field advection.	
13	Diffusion and filtering.	
14	Energy adjustment.	
15	Processed dynamics diags.	
16	Processed physics diags.	
17	Sulphur Cycle.	
18	Data assimilation.	
19	Vegetation.	
20	Field Calc Diagnostic	
26	River Routing	
30	Processed Climate diagnostics	
31	LBC fields for input (ie. by a LAM model)	
32	LBC fields for output.	
33	Atmospheric Tracers	
34	UKCA Chemistry	

		Select Diagnostic to	Add.		
Section	Item	Diagnostic Name. Double click to add	Help Available ?	Available	User/System
34	30	MACR MASS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	31	MACROOH MS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	32	MPAN MASS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	33	HACET MASS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	34	MGLY MASS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	35	NALD MASS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	36	HCOOH MASS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	37	MeCO3H MAS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	38	MeCO2H MAS MIXING RATIO AFTER TSTEP	No help	Y	USER
34	59	03P MASS MIXING RATIO AFTER TSTEP	No help	N	USER
34	90	ISO2 MASS MIXING RATIO AFTER TSTEP	No help	N	USER
34	94	MeOH MASS MIXING RATIO AFTER TSTEP	No help	N	USER
34	95	MACRO2 MAS MIXING RATIO AFTER TSTEP	No help	N	USER
34	150	AGE OF AIR in SECONDS	No help	N	USER
34	512	NEW DIAGNOSTIC	No help	Y	USER
Inert	Inert	Active	Active	Inert	Inert



🕅 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	ТЗНММ	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
--------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--

			STAS	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
34	512	NEW DIAGNOSTIC				Y	+	Y		USER	Δ
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	ТЗНММ	DIAG	UPD	Y	+K	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	$\overline{\nabla}$
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	T3HMN	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
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	STASH												
Sec	ltem	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System			
34	512	NEW DIAGNOSTIC	TDMPMN	DALLTH	UPMEAN	Y	+	Y		USER	$\overline{\Delta}$		
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM			
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM			
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM			
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM			
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	$ \nabla $		
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert			

Domain Profile

🔀 STASH Panel ATMOS. Experiment xhkp, Job a

H Profil	es Diagn	ostics	Help								
T Bdit P Delete Copy P	rofile Profile rofile	► able Bdît ► Bdît ► Bdît	time domain usage	TDAYRAD TDPMUKCA	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
Domain P	rofiles availa	able			1						<u> </u>
DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
Usage Pro	ofiles availal	ble]]	
UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

	STASH													
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System				
34	512	NEW DIAGNOSTIC	TDMPMN	DALLTH	UPMEAN	Y	+	Y		USER	$\overline{\Delta}$			
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM				
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM				
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM				
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM				
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	X	SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	7			
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert				

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Domain Profile

Profiles Diagnostics	Help	
Bdit Profile ▷ Bdit Profile ▷ Delete Profile ▷ Copy Profile ▷ Bdit	time domain usage	
\varTheta \varTheta 🕙 🔣 Domain	profile specification (Levels) : Job xhkp.a: "UKCA-TropIsop HEC	ToR Phase2b N48L60 QESM-A"
Domain profile name DALLTH	4	
\diamond	Variables derived on a single or unspecified level	
\diamond	Variables derived on model rho levels (Charney-Philips grid)	
+	Variables derived on model theta levels (Charney-Philips grid)	
\diamond	Variables on deep soil levels	
Select vertical level type 🔷	Variables on pressure levels (hPa)	
\diamond	Variables on geometric height levels (m)	
\diamond	Variables on constant theta surfaces (K)	
\$	Variables on potential vorticity levels	
\$	Variables on cloud threshold levels (octas)	
Specification of levels by \diamondsuit	Range of model levels List of selected model levels	
Range starting at (see Level N	James Help) ATMOS_BOTTOM Co	onverts to: 1
Range ending at (see Level N	lames Help) ATMOS_TOP Co	priverts to: 60
Level Names Help	Help Abandon changes Close P	SEUDO HORIZ TSERIES
	Window Name : atmos_STASH_Domain. Job xhkp).a. //



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- We have passed this diagnostic through to **UPMEAN**, but what does this mean?
- There are 12 streams in the UM that lead to output files. I will cover the first 11 later, but the 12th is the climate meaning stream
 - This stream works slightly differently to the other streams, where "what you see is what you get"
 - The behaviour of the climate meaning stream is controlled elsewhere in the UMUI



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	😸 🖯 🧑 🐹 Means : Job xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"
	📀 No dumping or climate meaning
🔿 🔿 📉 umui application. Navigation of Job xhkp.a: "UKCA-TropIsop HECToR Phase	Select dumping and meaning option 🔶 Regular frequency dumps with possible meaning sequence
Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling FCM Configuration Compilation and Modifications Reconfiguration Independent Section Options Post Processing Atmosphere Model Configuration Scientific Parameters and Sections Data assimilation and temporal filtering Ancillary and input data files STASH Control Post processing, Dumping & Meaning Ohices of non-scientific sections Output data files (LBCs etc) Error Checking STASH Colices Output data files (LBCs etc) Error Checking STASH Cice MEMO Cice Mean Error Checking STASH Cice	Regular frequency dumps for Gregorian-calendar Meaning STASHmaster controlled packing for diagnostic and primary fields. Select dumping packing option Unpacked primary fields. STASHmaster-packed diagnostics. Unpacked primary and diagnostic fields. Using Unit Days Hours Timesteps Restart dump STASHmaster controlled packing for diagnostic and primary fields. Using Unit Days Hours Timesteps Stasting at the (nth restart dump) Set frequencies to 0 for never Stasting a meaning sequence Using reference date for meaning Year Month Day Hour Minute Second
	Second ,
	Elsewhere, you have specified:
	A choice of the Climate-Mean code section is included . Climate-Means will work
	Push next to define further requirements.
	Help Abandon changes Close NEXT
UNIVERSITY OF	Window Name : atmos_Control_PostProc_DumpMean. Job xhkp.a.

pm (monthly mean) ps (seasonal mean) py (annual mean) px (decadal mean) files will be produced

🔿 🔿 📄 🔣 umui application. Navigation of Job x	hkp.a: "UKCA-TropIsop HECToR Phase2b N48L	_60 QESM-A"									
 Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling 	 Dumping and meaning User script release Define Climate-Mean sections chi O Climate Mean sections and M 	oice leaning sequences (2) : Job x	hkp.a: "UKCA-TropIsop HECToR Phase								
FCM Configuration	For regular dumping with climate	e meaning									
Compilation and Modifications Reconfiguration	Specify the number of meaning	periods to use (1 to 4) 4									
Independent Section Options Post Processing	Define requirement for your mea	ining sequence.									
Atmosphere Model Resolution and Domain	Specify period lengths in terms	of number of restart dumps for pe	riod 1								
-C Model Configuration	and then in multiples of the prev	ious period									
Scientific Parameters and Sections Data assimilation and temporal filtering	Specify frequencies as 'every n	th period-m mean'. Set to 0 if not	required								
Ancillary and input data files Ancillary and input data files		Means									
Control	Period length	PP files Required Y/N	PP files archived Y/N								
Choices of non-scientific sections	3	Y	Y								
Output data files (LBCs etc) Error Checking	3	Y	Y								
STASH macros	4	Y	Y								
	10	Y	Y 🔻								
	Edit	Edit	Edit								
Help Check Setup Save Process											
	Elsewhere, you have specified:										
	A choice of the Climate-Mean	code section is included . Clima	te-Means will work if selected								
	Push back to redefine requirements.										
	Help Abandon changes Close BACK										
UNIVERSITY OF	Window Name	e : atmos_Control_PostProc_Dum	npMean2. Job xhkp.a.								

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	ТЗНММ	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
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	STASH													
Sec	ltem	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System				
34	512	NEW DIAGNOSTIC	TDMPMN	DALLTH	UPMEAN	Y	+	Y		USER	$\overline{\Delta}$			
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM				
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM				
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM				
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM				
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM				
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	7			
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert				

🛛 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help Ŀ able ٦I TDAYRAD T6HDAYM TDAYM TDAYMON. TDAYMAX. TDAYMIN T6HMON T24HDMRV Edit Profile Þ Edit time TDPMUKCA T۱ Delete Profile R Edit domain Copy Profile Edit usage Domain Profiles available DIAG DALLTH DPBLTH DP17 DALLRH DA7ISCCP DPV2 DP500 DALLTHCL DIAGAOT DPFTS. DSOIL DTILE DP17ZM DICECAT DP4 DPBLRH DP31CCM DP31CCMZ DP10100 DP5 DP850200 DP855020

Usage Profiles available

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	UPN	MEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
--	-----	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--

	STASH												
Sec	ltem	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System			
34	512	NEW DIAGNOSTIC	TDMPMN	DALLTH	UPMEAN	Y	+	Y		USER	$\overline{\Delta}$		
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM			
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM			
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM			
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM			
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM			
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	$ \nabla $		
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert			

Profiles Diagnostics Help									
Bdit Profile>Bdit Profile>Delete Profile>Copy Profile>Bdit usage	Climate Me	aning							
😝 😑 😁 📉 STASH Usage pr	ofile. : Job xhkp.a: "UKCA-Trop	lsop HECToR Phase2b N4	18L60 QESM-A"						
Usage profile name UPMEAN									
·	🔷 Dump store with u	ser specified TAG, specify ta	ag below.						
	🐟 Secondary store v	vith user specified TAG, spe	cify tag below.						
Specify the final destination of the	e diagnostic 🔹 Dump store with c	limate mean TAG. Specify m	eaning periods below						
🔷 PP-file. Specify stream below									
	🔷 Send mean diagn	ostic direct to mean PP-file (climate mean sections only)						
🔳 Tagged for climate mean per	riod 1								
📕 Tagged for climate mean pe	iod 2								
📕 Tagged for climate mean pe	iod 3								
📕 Tagged for climate mean per	iod 4								
Elsewhere you have set up clima	te meaning as follows:								
Climate meaning is specified									
Number of climate mean periods:	4								
Push FILES to see settings of PP	-files to sub-models and reinitialisa	tion.							
Help	Abandon changes	Close	FILES						

Window Name : atmos_STASH_Usage.

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CAMBRIDGE

Job xhkp.a.

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NATURAL ENVIRONMENT RESEARCH COUNCIL

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

ASH	Profile	es Diagn	lost	ica	Help								
	Edit Pr Delete Copy Pr	Profile ► te Profile ► Profile ►		able Edit Edit Edit	time domain usage	TDAYRAD TDPMUKCA	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
D	omain Pr	ofiles availa	able	ILTH	DP17	DALLBH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
D	TILE	DP17ZM	DP8	50200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
U	sage Pro	∣ files availat	ble										

UPMEAN UPA UPC UPF UPG UPD UPB UPE UPH UPI UPJ	
--	--

			STASI	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
34	512	NEW DIAGNOSTIC	TDMPMN	DALLTH	UPMEAN	Y	+	Y		USER	$\overline{\Delta}$
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

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	Time profile name TDMPMN	
		No time processing. Field valid at output timesteps.
		 Time mean specify meaning period and sampling frequency below
	Specify time processing required	 Time series, specify recycling period and sampling frequency below
	1 / 1 3 1	Special daily-mean time series. Specify recycling period below.
Profiles Diagnostics Help		\sim Maximum value in a period, specify period and sampling frequency below
		\rightsquigarrow Minimum value in a period, specify period and sampling frequency below
Bdit Profile	Define the meaning period:	
Delete Profile	Time units 🛛 🔷 Days \prec	> Hours 🔷 Dump periods 💠 Timesteps
Conv Profile	Sampling period 1	
Goby Proline Edit usage	Define the sampling frequency to	make up the above:
· · · · · · · · · · · · · · · · · · ·	Time units	🔆 Days 💸 Hours 💸 Dump periods 🔶 Timesteps
	Frequency (every)	1
	Sampling offset (0 for no offset)) 0
	Specify the output times for the dia	agnostic
	Specification type 🛛 🔶 Regular	intervals 💊 Specified List
	Time units \land Days 💸 Hours	 Dump periods 🔷 Timesteps
	Starting	1
	Ending	-1
	Frequency (every)	1
	Set ending to -1 for the whole	run
	Number of times in the list	
		Output time list
		No. Values need to be sorted
UNIVERSITY OF		I I I I I I I I I I I I I I I I I I I
CAMBRIDGE CO		Inert Inert

• Points to remember:

- All fields sent to **UPMEAN must use TDMPMN** or a derivative (e.g. offset in temporal sampling of data c.f. **TDMNUKCA**)
- If e.g. **TMONMN** (monthly mean) is used then the data will be sampled incorrectly leading to problems with the values in the .pm files.

 If you are having problems outputting fields through climate meaning the solution is to send the data to another output stream



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000	🔪 🛛 🖹 umui application. Navigation of Job	hkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"	
	Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling FCM Configuration Compilation and Modifications Reconfiguration Independent Section Options Post Processing	 Main Switch + General Questions Initialization and processing of mean & standard PP files 	Other output streams
	Select packing profile for mean PP files	 Unpacked, profile 0 Packed as required for operational output streams, profile 1 Packed as required for standard climate output, profile 2 Packed as required for stratosphere model output, profile 4 New standard climate packing, profile 5 Simple GRIB packing, profile 6 	

🔲 GRIB format mean PP files

Define processing and post-processing requirements for the PP output streams. Define periodic re-initialization for those files which require automatic post processing.

					PP Files							
			Basics				For re	e-initialise	d PP files, al:	so specify		
Holp	PP File/Unit	Packing profile	Override size	GRIB FORMAT (Y/N)	Periodic Re-init	Period	Starting	Ending	Time Unit	Sub Model	Archiving	
Terb	PP0/PA/60	5	16000	N	Y	30	0	-1	DA	A	Y	$\overline{\Delta}$
_	PP1/PB/61	5	0	N	Y	1	0	-1	DA	A	Y	
	PP2/PC/62	5	16000	N	Y	90	0	-1	DA	A	Y	
	PP3/PD/63	5	16000	N	Y	30	0	-1	DA	A	Y	
	PP4/PE/64	5	16000	N	Y	30	0	-1	DA	A	Y	
	PP5/PF/65	5	0	N	Y	90	0	-1	DA	A	Y	
	PP6/PG/66	5	0	N	Y	90	0	-1	DA	A	Y	
	PP7/PH/67	5	0	N	Y	30	0	-1	DA	A	N	
	PP8/PI/68	5	0	N	Y	90	0	-1	DA	A	Y	
	PP9/PJ/69	5	0	N	Y	90	0	-1	DA	A	Y	
	PP10/PK/151	5	16000	N	Y	30	0	-1	DA	A	N	$\overline{\mathbf{Z}}$
	Inert	Edit	Edit	Edit	Edit	Edit	Edit	Edit	Edit	Edit	Edit	

Time units are: DA=days, H=hours, T=timesteps, RM=real months.

Packing profiles numbers are as defined for mean PP file.

A (Atmosphere) is currently the only valid sub-model.

Help

Abandon changes

Close

Other output streams

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	T3HMN	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
				·							

UPMEAN UPA UPC UPF UPG UPD UPB UPE UPH UPI UPJ	
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			STASI	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
34	512	NEW DIAGNOSTIC	тзнми	DALLTH	UPC	Y	+	Υ		USER	$\overline{\Delta}$
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

Other output streams

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<u>s</u> tash	Profiles	Diagnostics Help									
Ti	ime Proț			i.							
Τ	DMPMN	Load New Diagnostics	(Control-D)		T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
11	MONMN	Remove Diagnostic	(Control-r)	A							
F		Clone Diagnostic	(Control-c)	F							
		Output Table to File									
		Set Package Switches	(Control-t)	Γ							
D	omain P	Clear Table		L		D D L O	0.000		DIAGAGE	00570	
		Verify Diagnostics	(Control-v)	H	DATISCOP		DP500	DALLIHCL	DIAGAOT	DPFIS	DSOIL
		Re-check Availability		H	JUF4	DFBLKH	DF3TCCM	DESTCOME	DFIOTOO	DFJ	
		Sort Diagnostics			,		,	,	,	,	,
U	Isage Pr PMEAN	Change Sort Order		ŀ	UPD	UPB	UPE	UPH	UPI	UPJ	

			STAS	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
34	512	NEW DIAGNOSTIC	тзнми	DALLTH	UPC	Y	+	Y		USER	$\overline{\Delta}$
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	X	SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

Diagnostics Help			
Load New Diagnostics Remove Diagnostic	(Control-1) (Control-r)	Other out	put streams
Clone Diamostic	(Control-c)		
Clone Diagnostic Output Table to File Set Package Switches Clear Table Verify Diagnostics Re-check Availability Sort Diagnostics Change Sort Order	<pre>(Control-c) (Control-t) (Control-v)</pre>		Diagnostic Errors Diagnostic Errors Diag: "O3P_MASS MIXING RATIO AFTER TSTEP " (34,59) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "OH MASS MIXING RATIO AFTER TIMESTEP " (34,61) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "HO2 MASS MIXING RATIO AFTER TIMESTEP" (34,62) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeO MASS MIXING RATIO AFTER TIMESTEP" (34,62) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeO MASS MIXING RATIO AFTER TIMES " (34,63) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "EtOO MASS MIXING RATIO AFTER TSTEP " (34,64) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeCO3 MAS MIXING RATIO AFTER TSTEP " (34,65) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeCO3 MAS MIXING RATIO AFTER TSTEP " (34,65) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "n-PrOO MAS MIXING RATIO AFTER TSTEP " (34,66) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "h-PrOO MAS MIXING RATIO AFTER TSTEP " (34,66) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "h-PrOO MAS MIXING RATIO AFTER TSTEP " (34,67) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "h-PrOO MAS MIXING RATIO AFTER TSTEP " (34,67) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "h-PrOO MAS MIXING RATIO AFTER TSTEP " (34,67) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "h-PrOO MAS MIXING RATIO AFTER TSTE
Warning: You may exceed the m Estimated number of Pl 17190 fields in stream 5761 fields in Climate n 5761 fields in Climate n 5761 fields in Climate n 5761 fields in Climate n	naximum numbe P files to be wri 62 mean Period_1 mean Period_3 mean Period_4 D96 fields per s	er of PP fields per file itten: tream.	DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeCOCH2OO MMR AFTER TSTEP " (34,89) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "ISO2 MASS MIXING RATIO AFTER TSTEP " (34,90) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeOH MASS MIXING RATIO AFTER TSTEP " (34,94) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeOH MASS MIXING RATIO AFTER TSTEP " (34,94) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MACRO2 MAS MIXING RATIO AFTER TSTEP " (34,95) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MACRO2 MAS MIXING RATIO AFTER TSTEP " (34,95) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "AGE OF AIR in SECONDS " (34,150) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Warning: You may exceed the maximum number of PP fields per file Estimated number of PP files to be wr
Note: 'field' is	a 2D hor	rizontal field	Maximum allowed is 4096 fields per stream.
UNIVERSITY C CAMBRIDG	GE (Centre for Atm	Close

000	🔪 🛛 🖹 umui application. Navigation of Job	hkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"	
	Model Selection User Information and Target Machine Input/Output Control and Resources Sub-Model Configurations and Coupling FCM Configuration Compilation and Modifications Reconfiguration Independent Section Options Post Processing	 Main Switch + General Questions Initialization and processing of mean & standard PP files 	Other output streams
	Select packing profile for mean PP files	 Unpacked, profile 0 Packed as required for operational output streams, profile 1 Packed as required for standard climate output, profile 2 Packed as required for stratosphere model output, profile 4 New standard climate packing, profile 5 Simple GRIB packing, profile 6 	

🔲 GRIB format mean PP files

Define processing and post-processing requirements for the PP output streams. Define periodic re-initialization for those files which require automatic post processing.

					PP Files							
			Basics				For re	e-initialise	d PP files, al:	so specify		
Holp	PP File/Unit	Packing profile	Override size	GRIB FORMAT (Y/N)	Periodic Re-init	Period	Starting	Ending	Time Unit	Sub Model	Archiving	
Terb	PP0/PA/60	5	16000	N	Y	30	0	-1	DA	A	Y	$\overline{\Delta}$
_	PP1/PB/61	5	0	N	Y	1	0	-1	DA	A	Y	
	PP2/PC/62	5	16000	N	Y	90	0	-1	DA	A	Y	
	PP3/PD/63	5	16000	N	Y	30	0	-1	DA	A	Y	
	PP4/PE/64	5	16000	N	Y	30	0	-1	DA	A	Y	
	PP5/PF/65	5	0	N	Y	90	0	-1	DA	A	Y	
	PP6/PG/66	5	0	N	Y	90	0	-1	DA	A	Y	
	PP7/PH/67	5	0	N	Y	30	0	-1	DA	A	N	
	PP8/PI/68	5	0	N	Y	90	0	-1	DA	A	Y	
	PP9/PJ/69	5	0	N	Y	90	0	-1	DA	A	Y	
	PP10/PK/151	5	16000	N	Y	30	0	-1	DA	A	N	$\overline{\mathbf{Z}}$
	Inert	Edit	Edit	Edit	Edit	Edit	Edit	Edit	Edit	Edit	Edit	

Time units are: DA=days, H=hours, T=timesteps, RM=real months.

Packing profiles numbers are as defined for mean PP file.

A (Atmosphere) is currently the only valid sub-model.

Help

Abandon changes

Close

Other output streams

X STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profil	es availabl	e	
TO MARK AND			

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	ТЗНММ	TALLTS	TDPMUKCA							
Domain I	^o rofiles avai	lable									
DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
Liss and D.		- L I -									

UPMEAN UPA UPC UPF UPG UPD UPB UPE UPH UPI UPJ
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			STAS	H							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
34	512	NEW DIAGNOSTIC	тзнми	DALLTH	UPB	Y	+	Y		USER	$\overline{\Delta}$
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM	
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	X	SYSTEM	
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	$ \mathbf{A} $
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

Diagnostics Help		
Load New Diagnostics (Control-1) Remove Diagnostic (Control-r)	Other out	put streams
Clone Diamostic (Control-c)		
Output Table to File		
Sat Daskam Switches (Castrol-t)		Diag: "O3P_MASS MIXING RATIO AFTER TSTEP_" (34,59) (TDMPMN,DALLTH,UPMEAN)
Clear Table		DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "OH MASS MIXING RATIO AFTER TIMESTEP " (34,81) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration.
Verify Diagnostics (Control-v)		DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration.
Re-check Availability		Diag: "MeOO MASS MIXING RATIO AFTER TIMES " (34,83) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration.
Sort Diamostics		Diag: "EtOO MASS MIXING RATIO AFTER TSTEP " (34,84) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration.
Change Sort Order		Diag: "MeCO3 MAS MIXING RATIO AFTER TSTEP " (34,85) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration.
Warning: You may exceed the maximum numb Estimated number of PP files to be w 5761 fields in Climate mean Period_3 5761 fields in Climate mean Period_3 5761 fields in Climate mean Period_4 Maximum allowed is 4096 fields per s	er of PP fields per file ritten: 2 3 4 stream.	Diag: "I-PPOO MAS MIXING RATIO AFTER TSTEP " (34,87) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "EtCO3 MAS MIXING RATIO AFTER TSTEP " (34,88) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeCOCH2OO MMR AFTER TSTEP " (34,89) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "ISO2 MASS MIXING RATIO AFTER TSTEP " (34,90) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "ISO2 MASS MIXING RATIO AFTER TSTEP " (34,94) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MeOH MASS MIXING RATIO AFTER TSTEP " (34,95) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MACRO2 MAS MIXING RATIO AFTER TSTEP " (34,95) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "MACRO2 MAS MIXING RATIO AFTER TSTEP " (34,95) (TDMPMN,DALLTH,UPMEAN) DIAGNOSTIC DIAGNOSTIC ERROR: Diagnostic is not available for this model configuration. Diag: "AGE
Note: 'field' is a 2D ho	rizontal field	Maximum allowed is 4096 fields per stream.
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Other output streams

• Points to remember:

- When verifying diagnostics the climate meaning stream can usually take more than the 4096 specified (but not a massive amount more)
- If you have asked for many more fields for **UPMEAN** then you may need to move these fields to one of the PP-streams (**UPA**, **UPB**, etc.)
 - In these streams you will need to use **TMONMN** for a monthly mean etc.
- You may also need/want to make up your own temporal (and/or domain) profiles
 - These could be used in either the PP- or climate meaning streams



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Which levels?

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🔀 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	T3HMN	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

UPMEAN UP	PA UPC	C UPI	PF UF	IPG I	UPD	UPB	UPE	UPH	UPI	UPJ	
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	STASH														
Sec	ltem	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System					
34	512	NEW DIAGNOSTIC	тзнми	DALLRH	UPB	Y	+	Y		USER	$ \Delta $				
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM					
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM					
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM					
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM					
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	ТЗНММ	DIAG	UPD	Y	+K	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	X	SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇				
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert					

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles	Diagnostics Help								
Time Prof									
TDMPMN	Load New Diagnostics	(Control-D)	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	Remove Diagnostic	(Control-r)	<u> </u>						
	Clone Diagnostic	(Control-c)		1					
	Output Table to File								
	Set Package Switches	(Control-t)]			ļ]	J
Domain P	Clear Table	_	DA7ISCCP	DPV2	DP500		DIAGAOT	DPETS	DSOIL
DTILE	Verify Diagnostics	(Control-v) =	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
	Re-check Availability			1					
	Sort Diagnostics								
Usage Pr	Change Sort Order								
UPMEAN	·····	· · · · , · · · · · · ·	UPD	UPB	UPE	UPH	UPI	UPJ	

	STASH														
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System					
34	512	NEW DIAGNOSTIC	TALLTS	DALLTH	UPC	Y	+	Y		USER	$ \Delta $				
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM					
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM					
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM					
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM					
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	тзнми	DIAG	UPD	Y	+K	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇				
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert					

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Centre for Atmospheric Science



Θ	Θ	\bigcirc	X	Diagnostics	Table	Sort Order
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Input priority of columns for sorting (eg. "1 3 2")

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Other useful options

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

Н	Profiles	Diagnostics	Help									
T	ime Profi	iles availabl	e								[
Т	DMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYM		Sort	Quit
Т	MONMN	T90DAY	ТЗНММ	TALLTS	TDPMUKCA							
Ļ			ļ							ļ		
ŀ		<u> </u>		<u> </u>	<u> </u>					<u> </u>		
)omain P	∣ rofiles avail	able	1	1	1	1	1])	1	1
C	IAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
C	TILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
Γ												
ι	Jsage Pro	ofiles availa	ble									
L	IPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

			STAS	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
26	1	RIVER WATER STORAGE M2	T24H0Z	DIAG	UPA	Y	+D	Y		SYSTEM	$ \Delta $
15	215	THETA ON PV=+/-2 SURFACE	T24H0Z	DIAG	UPC	Y	+E	Y		SYSTEM	
16	222	PRESSURE AT MEAN SEA LEVEL	T24H0Z	DIAG	UPC	Y	+E	Y		SYSTEM	
30	201	U COMPNT OF WIND ON P LEV/UV GRID	T24H0Z	DP500	UPC	Y	+E	Y		SYSTEM	
30	202	V COMPNT OF WIND ON P LEV/UV GRID	T24H0Z	DP500	UPC	Y	+E	Y		SYSTEM	
30	207	GEOPOTENTIAL HEIGHT ON P LEV/UV GRID	T24H0Z	DP500	UPC	Y	+E	Y		SYSTEM	
8	245	INLANDBASINFLOW ATM GRID KG/M2/S	T24HDMRV	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
26	1	RIVER WATER STORAGE M2	T24HDMRV	DIAG	UPMEAN	N	+H	Y	Х	SYSTEM	
26	2	GRIDBOX OUTFLOW KG/S	T24HDMRV	DIAG	UPMEAN	N	+H	Y	Х	SYSTEM	
26	3	GRIDBOX INFLOW KG/S	T24HDMRV	DIAG	UPMEAN	N	+H	Y	Х	SYSTEM	∇
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

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<u>S</u> TASH	Profiles	Diagnostics Help									
-	Fime Prot			Ē							
	IDMPMN	Load New Diagnostics	(Control-1)	2	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
F	IMONMN	Remove Diagnostic	(Control-r)	2A 	<u> </u>			<u> </u>			<u> </u>
ŀ		Clone Diagnostic	(Control-c)								
		Output Table to File									
	Damain F	Set Package Switches	(Control-t)	[
l T	Domain F	Clear Table		[—	DAZISCOP	DPV2	DP500		DIAGAOT	DPETS	DSOIL
i i	DTILE	Verify Diagnostics	(Control-v)	ŀ	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
		Re-check Availability								Í	
		Sort Diagnostics		ŀ							
ı آ	U sage Pr JPMEAN	Change Sort Order	,	-	UPD	UPB	UPE	UPH	UPI	UPJ	

			STASI	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
26	1	RIVER WATER STORAGE M2	T24H0Z	DIAG	UPA	Y	+D	Y		SYSTEM	$ \Delta $
15	215	THETA ON PV=+/-2 SURFACE	T24H0Z	DIAG	UPC	Y	+E	Y		SYSTEM	
16	222	PRESSURE AT MEAN SEA LEVEL	T24H0Z	DIAG	UPC	Y	+E	Y		SYSTEM	
30	201	U COMPNT OF WIND ON P LEV/UV GRID	T24H0Z	DP500	UPC	Y	+E	Y		SYSTEM	
30	202	V COMPNT OF WIND ON P LEV/UV GRID	T24H0Z	DP500	UPC	Y	+E	Y		SYSTEM	
30	207	GEOPOTENTIAL HEIGHT ON P LEV/UV GRID	T24H0Z	DP500	UPC	Y	+E	Y		SYSTEM	
8	245	INLANDBASINFLOW ATM GRID KG/M2/S	T24HDMRV	DIAG	UPMEAN	Y	+H	Y		SYSTEM	
26	1	RIVER WATER STORAGE M2	T24HDMRV	DIAG	UPMEAN	N	+H	Y	Х	SYSTEM	
26	2	GRIDBOX OUTFLOW KG/S	T24HDMRV	DIAG	UPMEAN	N	+H	Y	Х	SYSTEM	
26	3	GRIDBOX INFLOW KG/S	T24HDMRV	DIAG	UPMEAN	N	+H	Y	Х	SYSTEM	∇
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

🕅 STASH Panel ATMOS. Experiment xhkp, Job a

STASH Profiles Diagnostics Help

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Time Profiles available

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	тзнми	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

UPMEAN UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
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	STASH														
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System					
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM	$ \Delta $				
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM					
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM					
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDAYRAD	DIAG	UPF	Y	+F	Y		SYSTEM					
0	23	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	TDMPMN	DIAG	UPMEAN	Y	+H	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	ТЗНММ	DIAG	UPD	Y	+K	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYM	DIAG	UPA	Y	+N	Y		SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDAYMON	DIAG	UPJ	Y	Р	Y	Х	SYSTEM					
0	24	SURFACE TEMPERATURE AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM					
0	25	BOUNDARY LAYER DEPTH AFTER TIMESTEP	TDMPMN	DIAG	UPMEAN	Y	+A	Y		SYSTEM	∇				
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert					

- You can also:
 - Output table to file (very useful for comparing STASH between jobs)
 - Set package switches
 - A set of diagnostics can be grouped together and turned on or off from the package table

Diagnostics Help	
Load New Diagnostics	(Control-1)
Remove Diagnostic	(Control-r)
Clone Diagnostic	(Control-c)
Output Table to File	
Set Package Switches	(Control-t)
Clear Table	
Verify Diagnostics	(Control-v)
Re-check Availability	
Sort Diagnostics	
Change Sort Order	



Centre for Atmospheric Science



Package Switches

Θ	0		X STAS	H Pa	anel ATMOS	. Experimen	t xhkp, Job a	ι			
<u>s</u> tash	Profiles	Diagnostics Help									
٦	Fime Prof										
[[DMPMN]	Load New Diagnostics	(Control-1)	Σ	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
1	[MONMN	Remove Diagnostic	(Control-r)	<u>CA</u>			<u> </u>				<u> </u>
ŀ		Clone Diagnostic	(Control-c)	┝							
Γ		Output Table to File									
Γ		Set Package Switches	(Control-t)	Ē							
	Domain F	Clear Table		L							
	DIAG	Verify Dismosting	(Control-u)		DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
0	DTILE	ACLUA NUMBUNALICA	TTY DIABUDATICA (COULLOI-4)		DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	
		Re-check Availability									
Γ		Sort Diagnostics									
Ļ	Usage Pr	Change Sort Order		L							
ju ju	JPMEAN	Jorn Jore Jor	jora		UPD	UPB	UPE	UPH	UPI	UPJ	

			STASI	Н							
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System	
34	301	Ox PROD: HO2+NO	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	$\overline{\Delta}$
34	302	Ox PROD: MeOO+NO	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	303	Ox PROD: NO+RO2	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	304	Ox PROD: OH+INORGANIC ACID	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	305	Ox PROD: OH+ORGANIC NITRATE	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	306	Ox PROD: ORGANIC NITRATE PHOTOLYSIS	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	307	Ox PROD: OH + PAN-TYPE REACTIONS	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	311	Ox LOSS: O(1D)+H2O	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	312	Ox LOSS: MINOR LOSS REACTIONS	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	
34	313	Ox LOSS: HO2+O3	TDPMUKCA	DALLTH	UPMEAN	Y	+U	Y		USER	$\overline{\mathbf{A}}$
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert	

Diagnostics | Help

Load New Diagnostics	(Control-1)						
Remove Diagnostic	(Control-r)						
Clone Diagnostic	(Control-c)						
Output Table to File							
Set Package Switches	(Control-t)						
Clear Table							
Verify Diagnostics	(Control-v)						
Re-check Availability							
Sort Diagnostics							
Change Sort Order							

Package Switches

😑 😑 💮 🔣 STASH Tags for Diagnostics : Job xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"

Package Include settings take effect on closure of this panel

		Diagnostic Packages	
Package	Include Y/N	Description of package	
Q	N	NAO	$\overline{\Delta}$
R	Y	Extremes	
S	Y	Seasonal-decadal prediction	
Т	N	Sudden stratospheric warmings	
U	Y	UKCA Ox/CO Budget CheT/CheST	
V	Y	UKCA CheT/CheST Diagnostics	
W	N	UKCA CheS/CheST Diagnostics	
Х	Y	UKCA CheM Diagnostics	
Y			
Z			$\overline{\nabla}$
Inert	Edit	Edit	
	Help	Abandon changes Close	
		Window Name : atmos_STASH_Tags. Job xhkp.a.	

😑 😑 🙆 🔣 🔀 STASH Tags for Diagnostics : Job xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"

Package Include settings take effect on closure of this panel

		Diagnostic Packages							
Package	Include Y/N	Description of package							
Q	N	NAO							
R	Y	Extremes							
s	Y	Seasonal-decadal prediction							
т	N	Sudden stratospheric warmings							
U	N	UKCA Ox/CO Budget CheT/CheST							
V	Y	UKCA CheT/CheST Diagnostics							
W	N	KCA CheS/CheST Diagnostics							
Х	Y	JKCA CheM Diagnostics							
Y									
Z			7						
Inert	Edit	Edit							
		<u> </u>	(
	Help	Abandon changes	Close						



Window Name : atmos_STASH_Tags. Job xhkp.a.

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Package Switches

X STASH Panel ATMOS. Experiment xhkp, Job a

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STASH Profiles Diagnostics Help

Time	Profiles	available
IIIIIe	LIANGE	avanable

TDMPMN	T6HDM	T24H0Z	T6H	TDAYRAD	T6HDAYM	TDAYM	TDAYMON	TDAYMAX	TDAYMIN	T6HMON	T24HDMRV
TMONMN	T90DAY	T3HMN	TALLTS	TDPMUKCA							

Domain Profiles available

DIAG	DALLTH	DPBLTH	DP17	DALLRH	DA7ISCCP	DPV2	DP500	DALLTHCL	DIAGAOT	DPFTS	DSOIL
DTILE	DP17ZM	DP850200	DP855020	DICECAT	DP4	DPBLRH	DP31CCM	DP31CCMZ	DP10100	DP5	

	UPMEAN L	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	
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	STASH													
Sec	ltem	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System				
34	301	Ox PROD: HO2+NO	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	Х	USER	Δ			
34	302	Ox PROD: MeOO+NO	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	х	USER				
34	303	Ox PROD: NO+RO2	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	х	USER				
34	304	Ox PROD: OH+INORGANIC ACID	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	Х	USER				
34	305	Ox PROD: OH+ORGANIC NITRATE	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	Х	USER				
34	306	Ox PROD: ORGANIC NITRATE PHOTOLYSIS	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	х	USER				
34	307	Ox PROD: OH + PAN-TYPE REACTIONS	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	Х	USER				
34	311	Ox LOSS: O(1D)+H2O	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	Х	USER				
34	312	Ox LOSS: MINOR LOSS REACTIONS	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	Х	USER				
34	313	0x LOSS: H02+03	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER	7			
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert				