UNIVERSITY OF CAMBRIDGE

ACITES Atmospheric Chemistry In The Earth System

National Centre for Atmospheric Science
NATURAL ENVIRONMENT RESEARCH COUNCIL

What is STASH?

Luke Abraham

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

Centre *for* **Atmospheric Science**

Outline

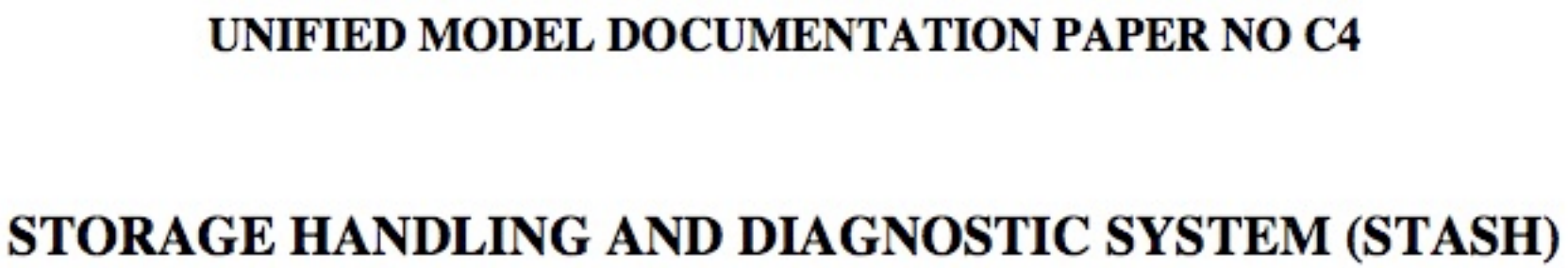
- What is UKCA and what can I do with it?
- Why should I use it?
- What resources are available?
- Feedback

- UKCA Tutorials

- STASH

What is STASH?

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

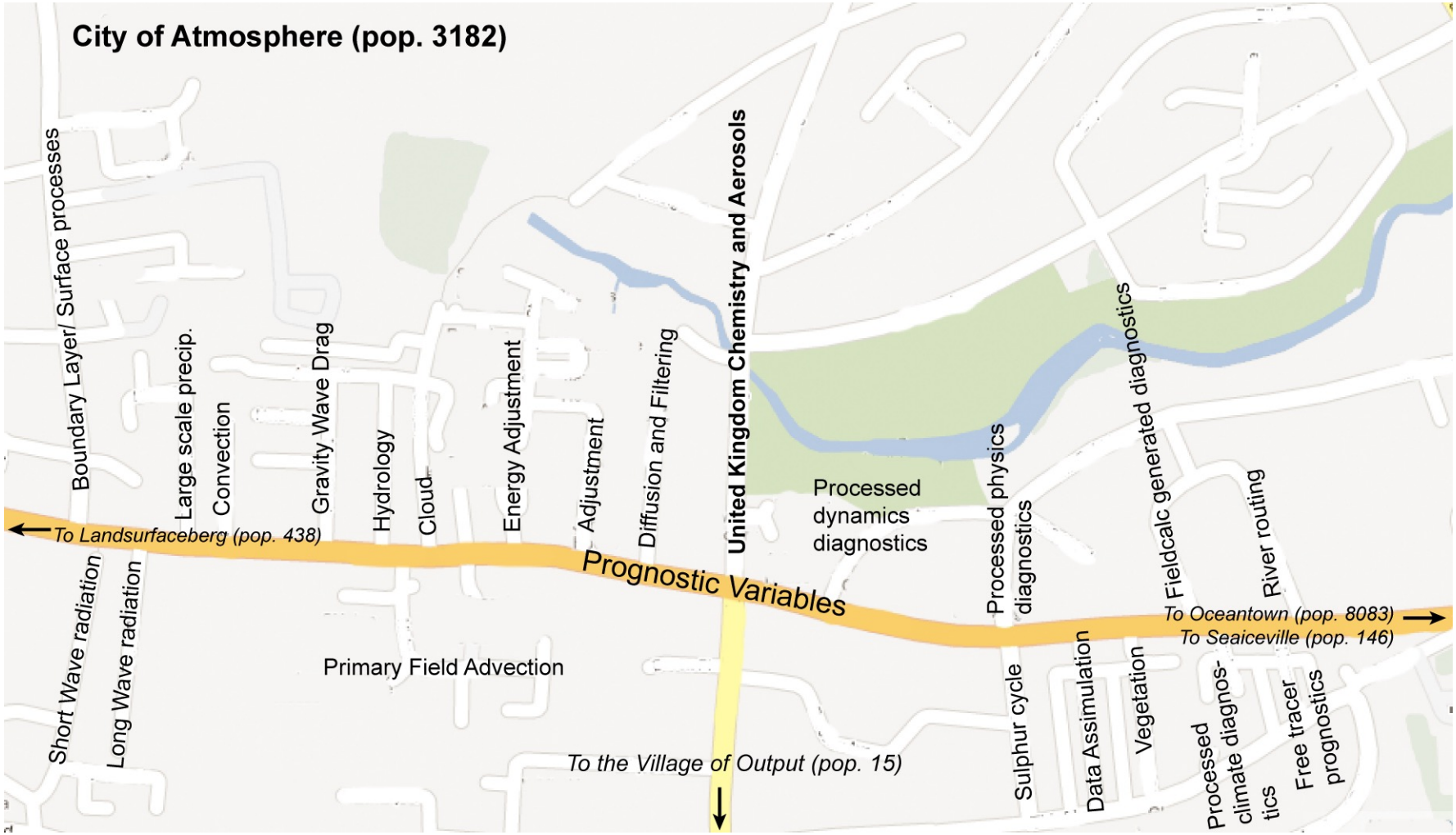


UNIFIED MODEL DOCUMENTATION PAPER NO C4

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

Model Sections



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)

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 (***jobid*****a.da********)
- In the code these prognostics are held within a master array called **`D1`**

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

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)

Examples

```
#
1|     1 |    34 |     7 |HONO2 MASS MIXING RATIO AFTER TSTEP |
2|     2 |     0 |     1 |     1 |     2 |    10 |    11 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000007 | 0000000000000000001 |     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 |    -1 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000000 | 0000000000000000001 |     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| 00000000000000000000000000000000 | 0000000000000000001 |     3 |
4|     1 |     0 | -99   -99   -99   -99   -99   -99   -99   -99   -99   -99 |
5|     0 |  1871 |     1 |    65 |     0 |     0 |     0 |     0 |     0 |
#
```

Examples

```
#
1|     1 |    34 |     7 |HONO2 MASS MIXING RATIO AFTER TSTEP |
2|     2 |     0 |     1 |     1 |     2 |    10 |    11 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000007 | 0000000000000000001 |     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 |    -1 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000000 | 0000000000000000001 |     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| 00000000000000000000000000000000 | 0000000000000000001 |     3 |
4|     1 |     0 | -99   -99   -99   -99   -99   -99   -99   -99   -99   -99 |
5|     0 |  1871 |     1 |    65 |     0 |     0 |     0 |     0 |     0 |
#
```

Examples

```
#
1|     1 |    34 |     7 |HONO2 MASS MIXING RATIO AFTER TSTEP |
2|     2 |     0 |     1 |     1 |     2 |    10 |    11 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000007 | 00000000000000000001 |     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 |    -1 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000 | 00000000000000000001 |     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| 00000000000000000000000000000 | 00000000000000000001 |     3 |
4|     1 |     0 | -99   -99   -99   -99   -99   -99   -99   -99   -99   -99 |
5|     0 |  1871 |     1 |    65 |     0 |     0 |     0 |     0 |     0 |
#
```

Examples

```
#
1|     1 |    34 |     7 |HONO2 MASS MIXING RATIO AFTER TSTEP |
2|     2 |     0 |     1 |     1 |     2 |    10 |    11 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000007 | 0000000000000000001 |     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 |    -1 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000000 | 0000000000000000001 |     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| 00000000000000000000000000000000 | 0000000000000000001 |     3 |
4|     1 |     0 | -99   -99   -99   -99   -99   -99   -99   -99   -99   -99 |
5|     0 |  1871 |     1 |    65 |     0 |     0 |     0 |     0 |     0 |
#
```

Removing a field from a UM dump

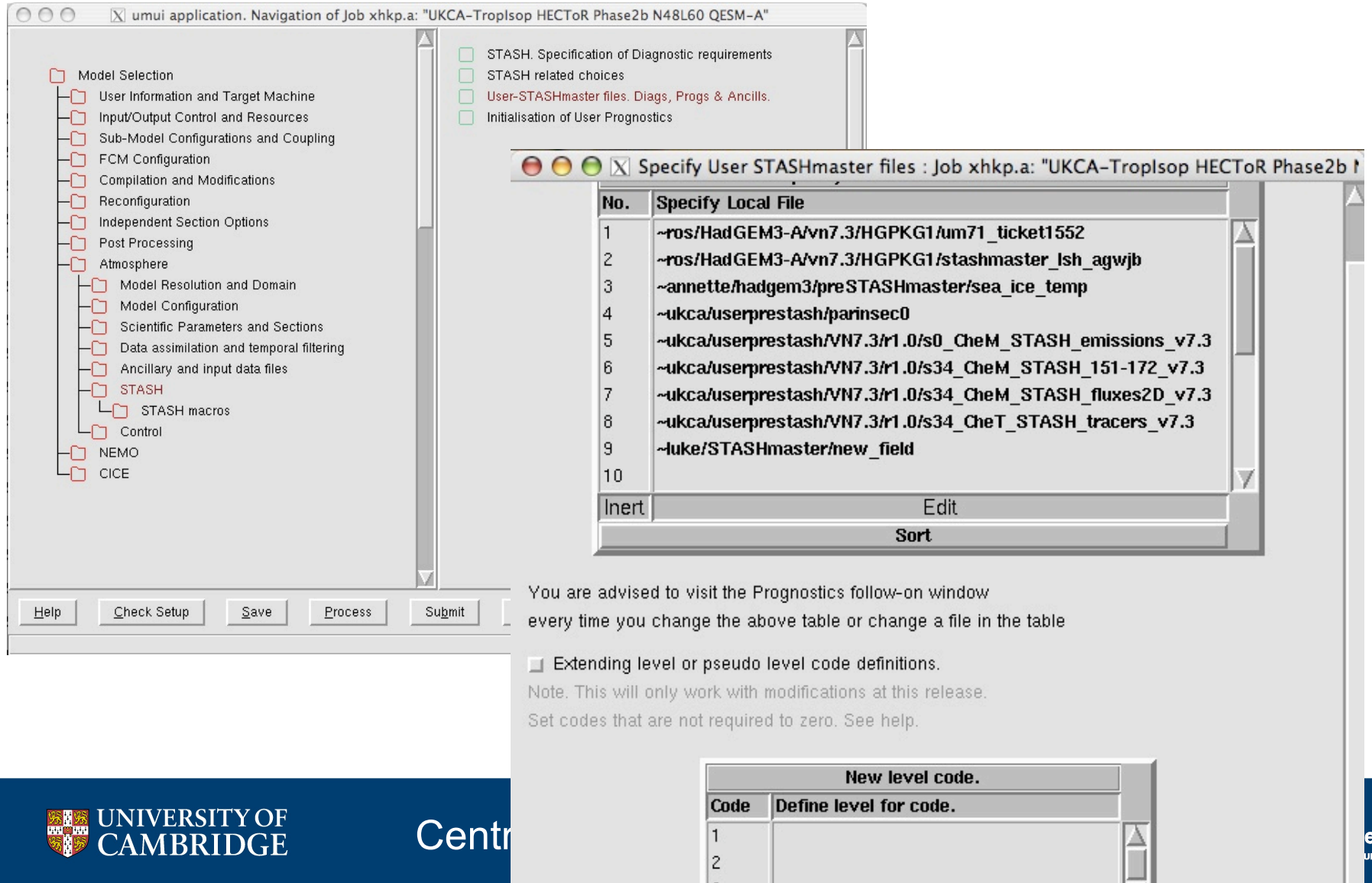
```
#
1|     1 |     0 |   309 |C5H8 surf emissions                          |
2|     2 |     0 |     1 |     1 |     5 |   -1 |   -1 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000000 | 0000000000000000001 |     3 |
4|     1 |     0 | -99   -99   -99   -99   -99   -99   -99   -99   -99   -99 |
5|     0 |   539 |     0 |   129 |     0 |     0 |     0 |     0 |     0 |
#

#
1|     1 |     0 |   309 |C5H8 surf emissions                          |
2|    10 |     0 |     1 |     1 |     5 |   -1 |   -1 |     0 |     0 |     0 |     0 |
3| 00000000000000000000000000000000 | 0000000000000000001 |     3 |
4|     1 |     0 | -99   -99   -99   -99   -99   -99   -99   -99   -99   -99 |
5|     0 |   539 |     0 |   129 |     0 |     0 |     0 |     0 |     0 |
#
```

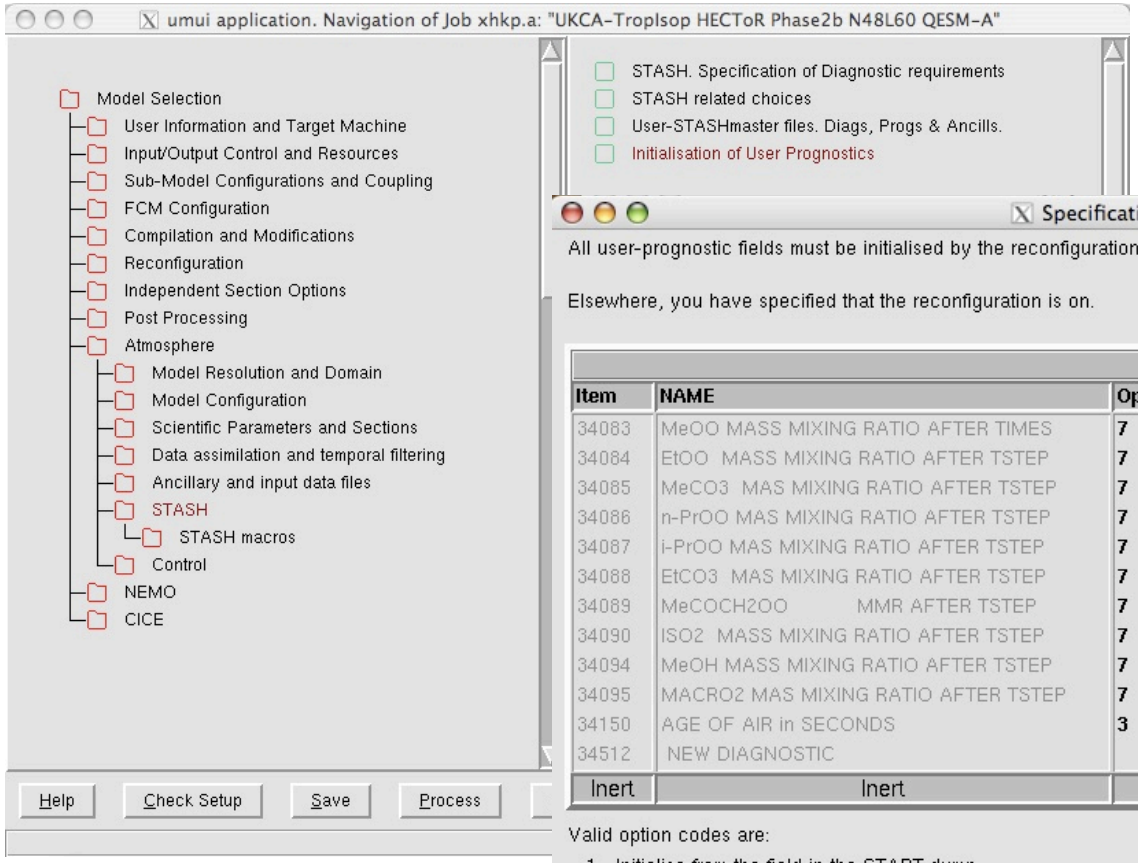
Adding your diagnostic to the UMUI

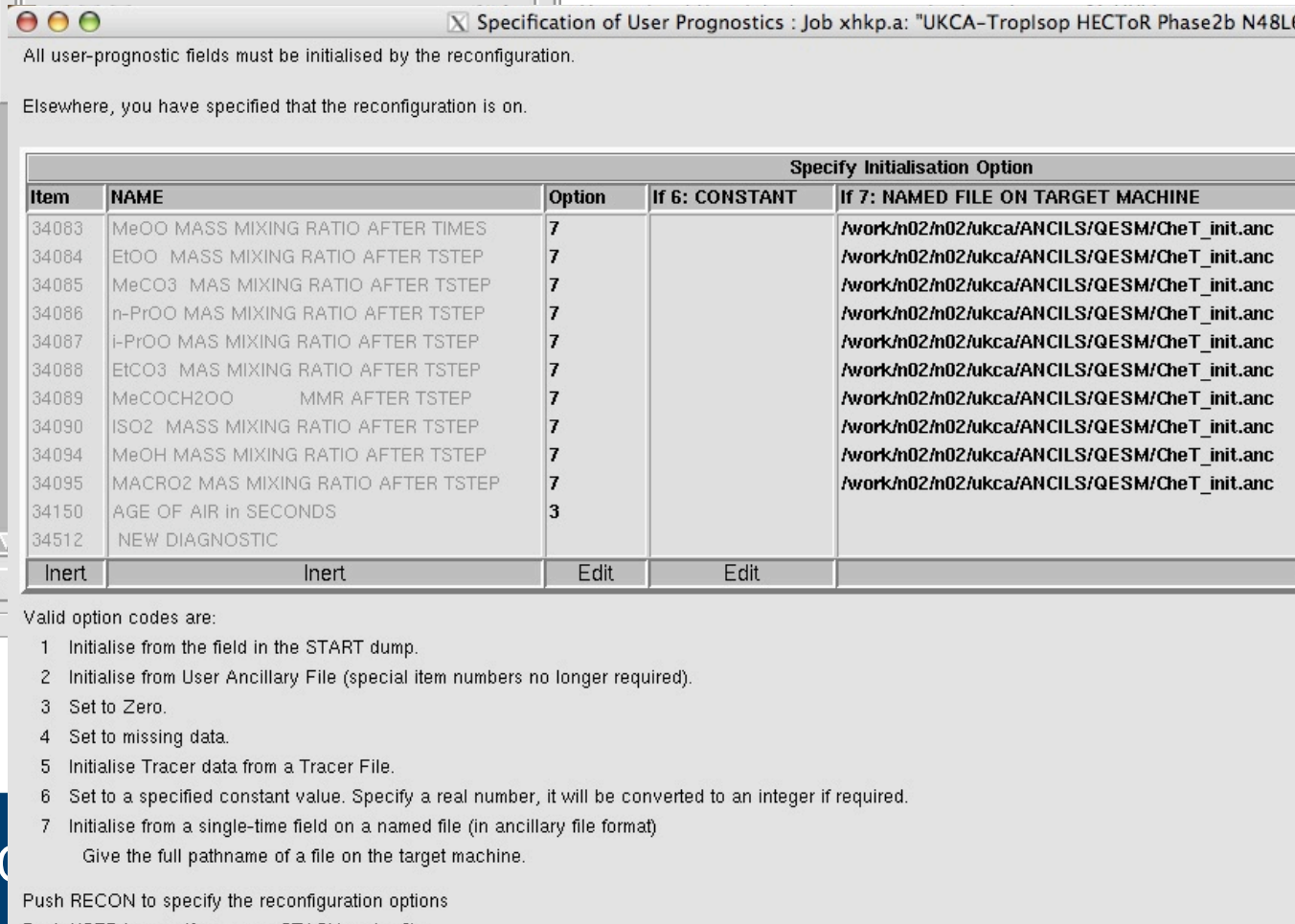
```
H1| SUBMODEL_NUMBER=1
H2| SUBMODEL_NAME=ATMOS
H3| UM_VERSION=7.3
#
#|Model |Sectn | Item |Name                                  |
#|Space |Point | Time | Grid |LevelT|LevelF|LevelL|PseudT|PseudF|PseudL|LevCom|
#| Option Codes         | Version Mask          | Halo |
#|DataT |DumpP | PC1  PC2  PC3  PC4  PC5  PC6  PC7  PC8  PC9  PCA |
#|Rotate| PPFC | USER | LBVC | BLEV | TLEV |RBLEVV| CFLL | CFFF |
#
1|    1 |   34 |  512 | NEW DIAGNOSTIC                       |
2|    0 |    0 |    1 |    1 |    2 |   10 |   11 |    0 |    0 |    0 |    0 |
3| 00000000000000000000000000000000 | 00000000000000000001 |    3 |
4|    1 |    0 | -99  -99  -99  -99  -99  -99  -99  -99  -99  -99 |
5|    0 | 1871 |    1 |   65 |    0 |    0 |    0 |    0 |    0 |
#
1|   -1 |   -1 |   -1 |END OF FILE MARK                      |
2|    0 |    0 |    0 |    0 |    0 |    0 |    0 |    0 |    0 |    0 |    0 |
3| 00000000000000000000000000000000 | 00000000000000000000 |    0 |
4|    0 |    0 | -99  -99  -99  -99  -30  -99  -99  -99  -99  -99 |
5|    0 |    0 |    0 |    0 |    0 |    0 |    0 |    0 |    0 |
#
```

Adding your diagnostic to the UMUI

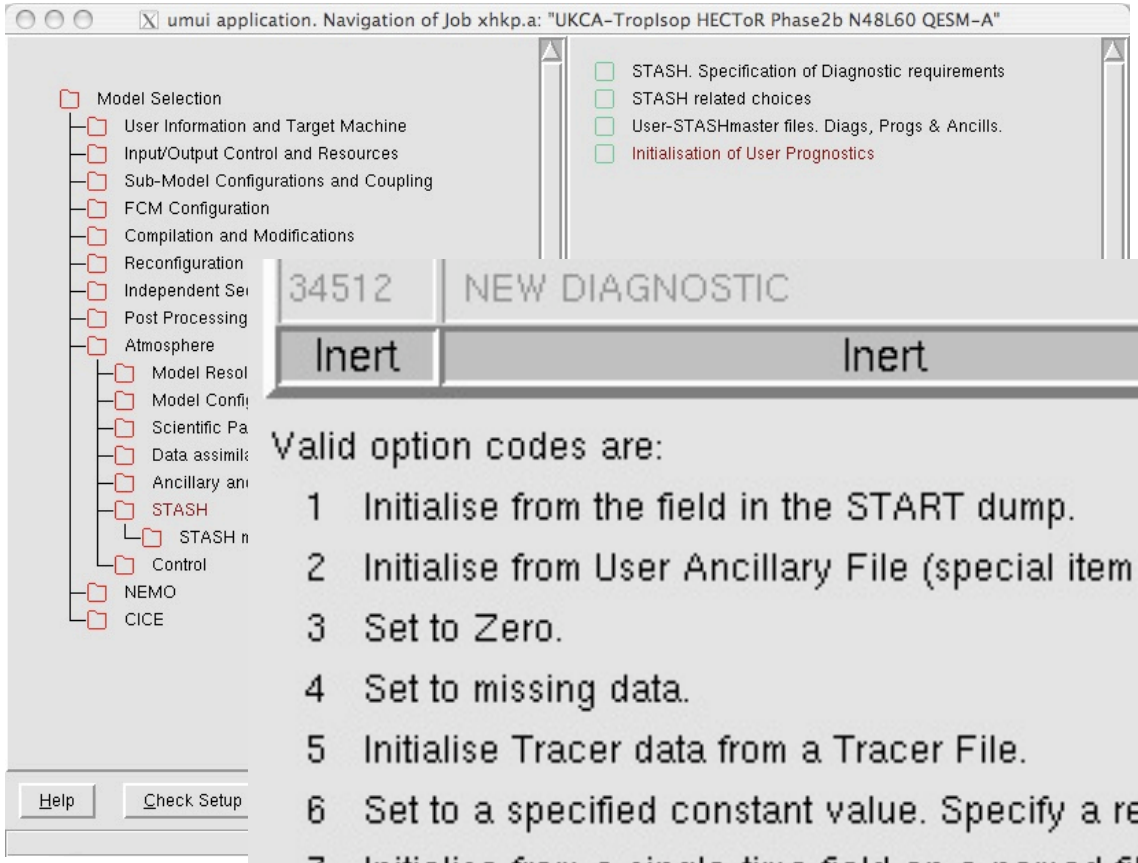


Adding your diagnostic to the UMUI





Adding your diagnostic to the UMUI



34512	NEW DIAGNOSTIC		
Inert	Inert	Edit	Edit

Valid option codes are:

1 Initialise from the field in the START dump.

2 Initialise from User Ancillary File (special item numbers no longer required).

3 Set to Zero.

4 Set to missing data.

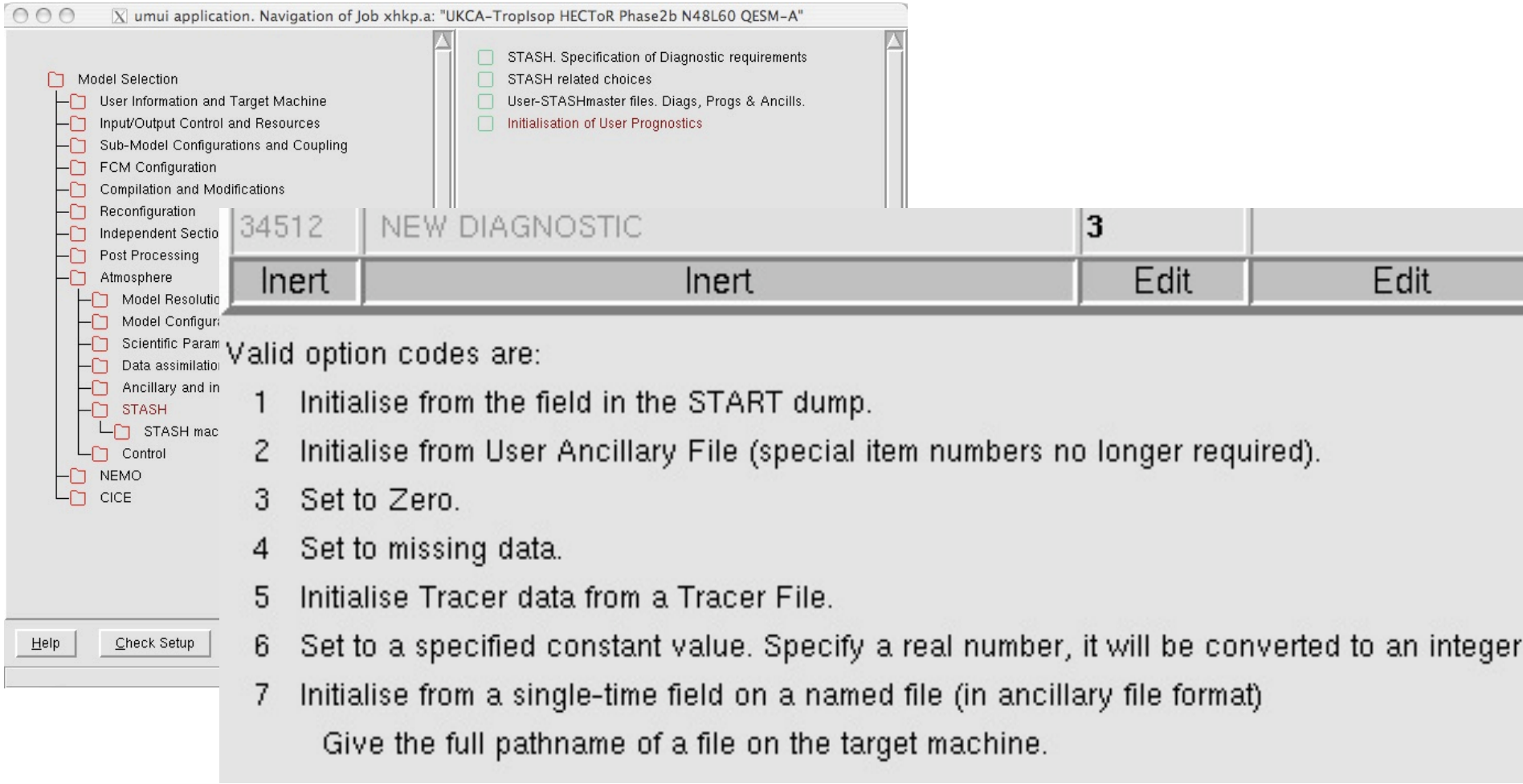
5 Initialise Tracer data from a Tracer File.

6 Set to a specified constant value. Specify a real number, it will be converted to an integer

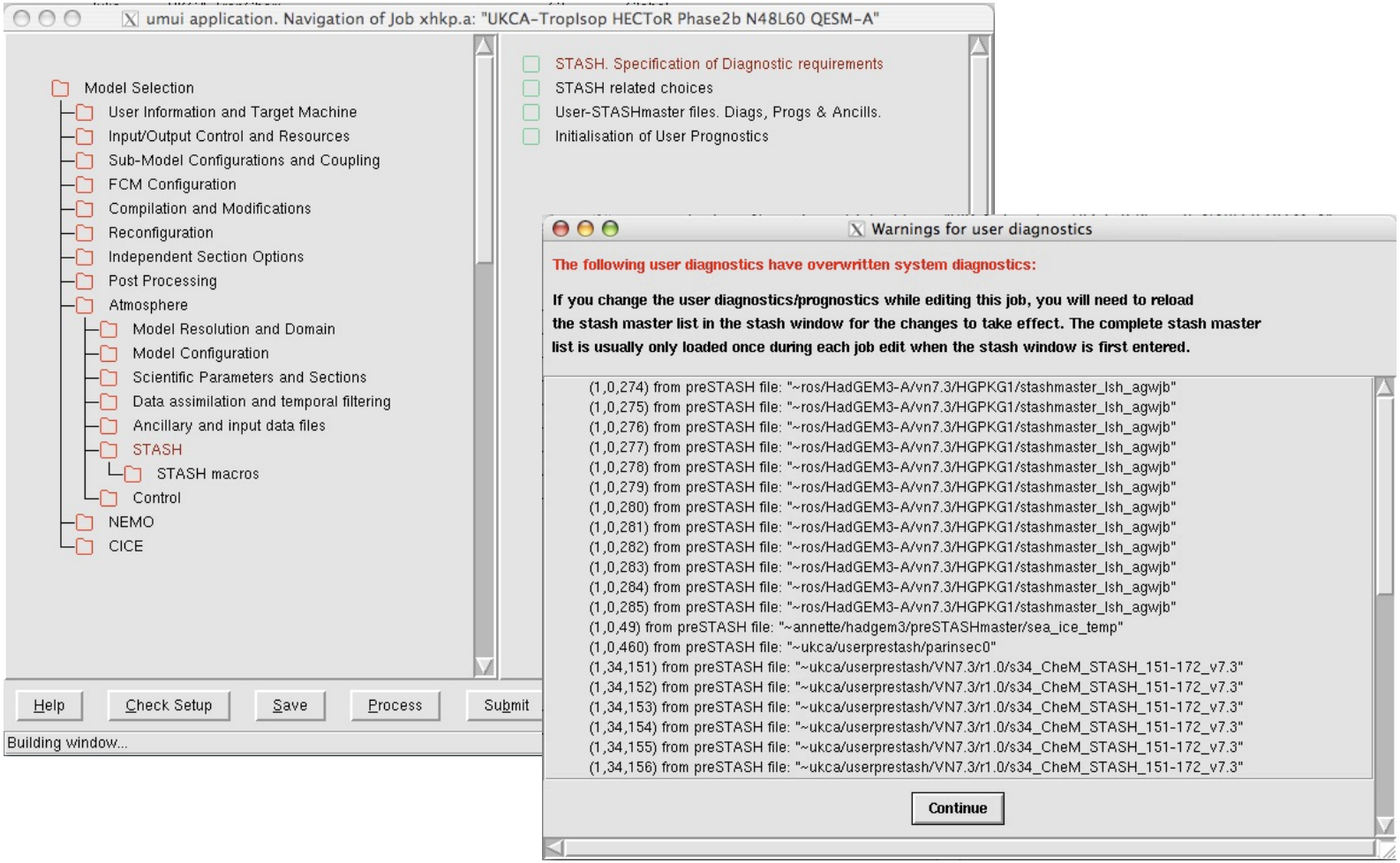
7 Initialise from a single-time field on a named file (in ancillary file format)

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

Adding your diagnostic to the UMUI



Adding your diagnostic to the UMUI



Adding your diagnostic to the UMUI

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	

Usage Profiles available

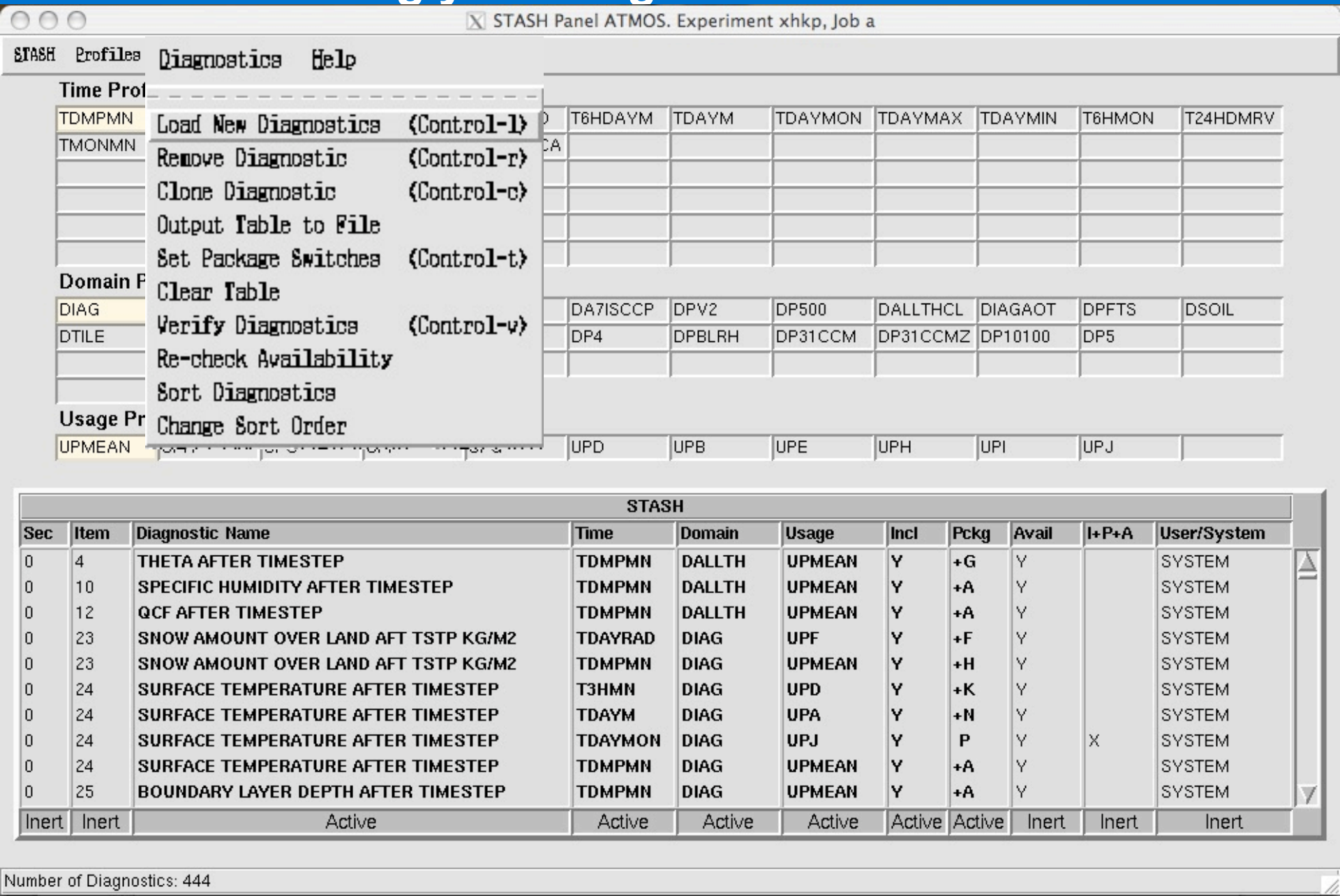
UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

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
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	T3HMN	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	P	Y	X	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

Number of Diagnostics: 444

Adding your diagnostic to the UMUI

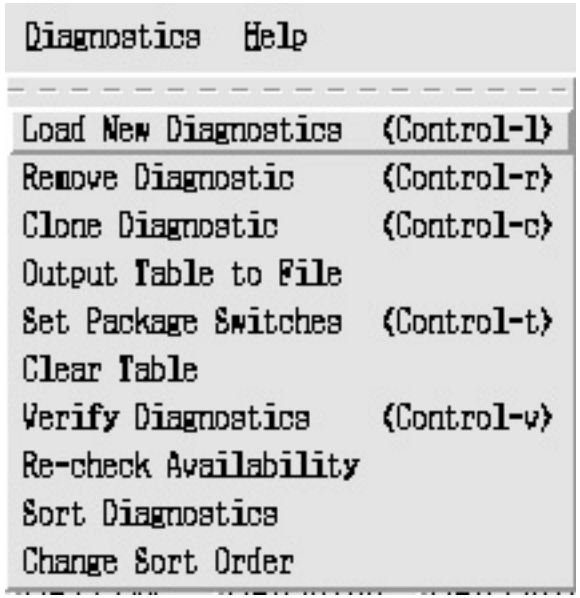


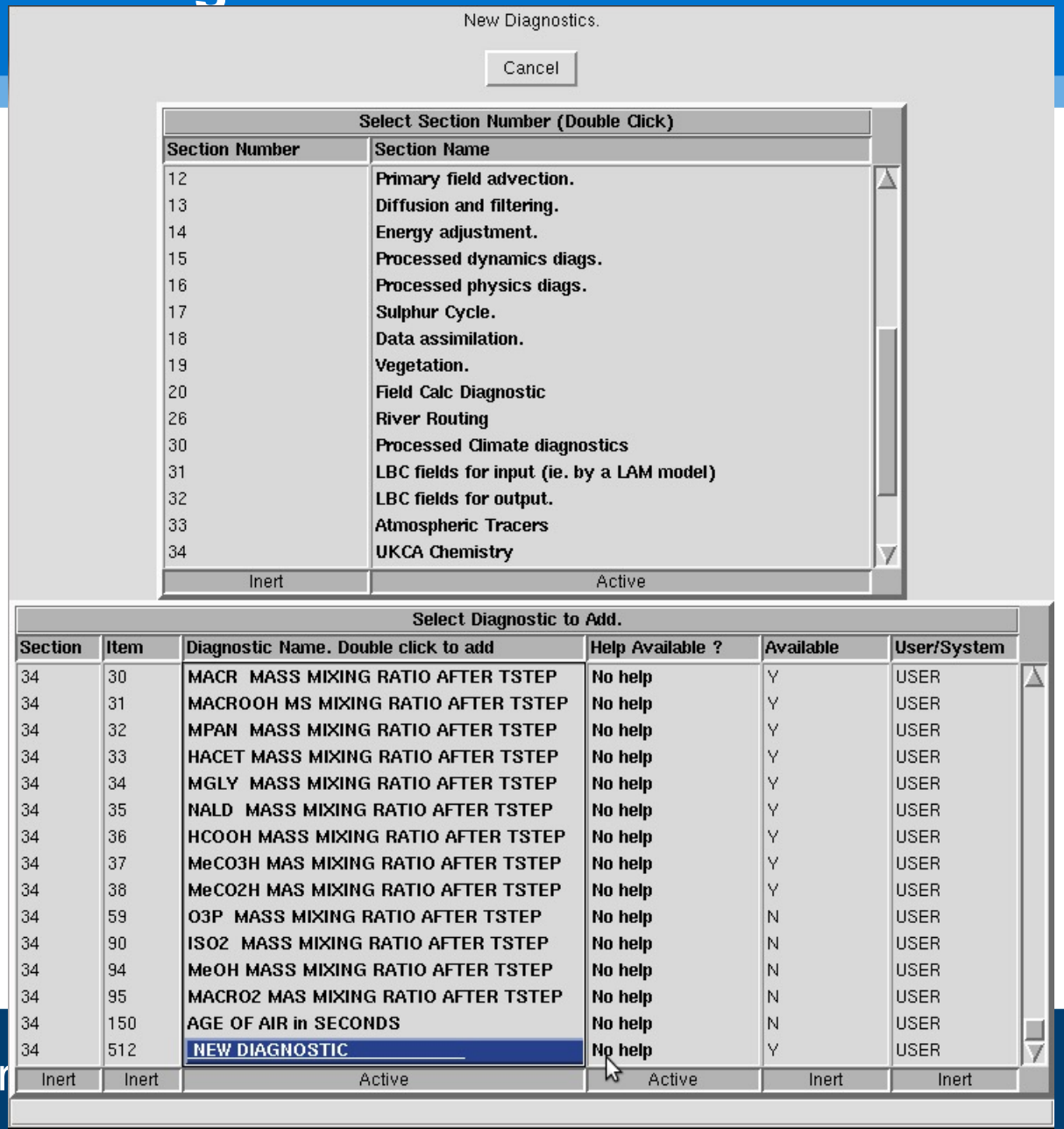
STASH

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
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	T3HMN	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	P	Y	X	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

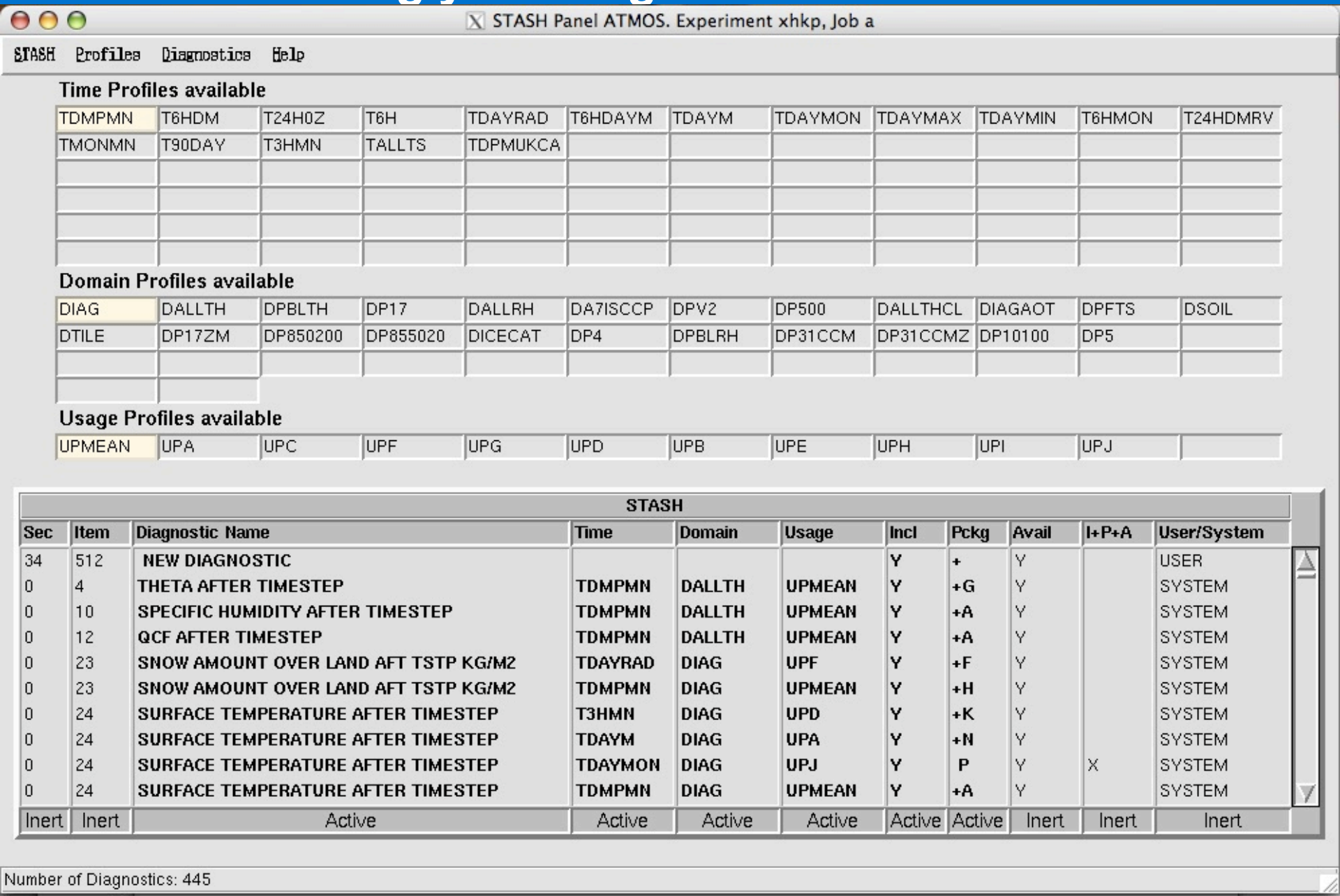
Number of Diagnostics: 444

Adding your diagnostic to the UMUI

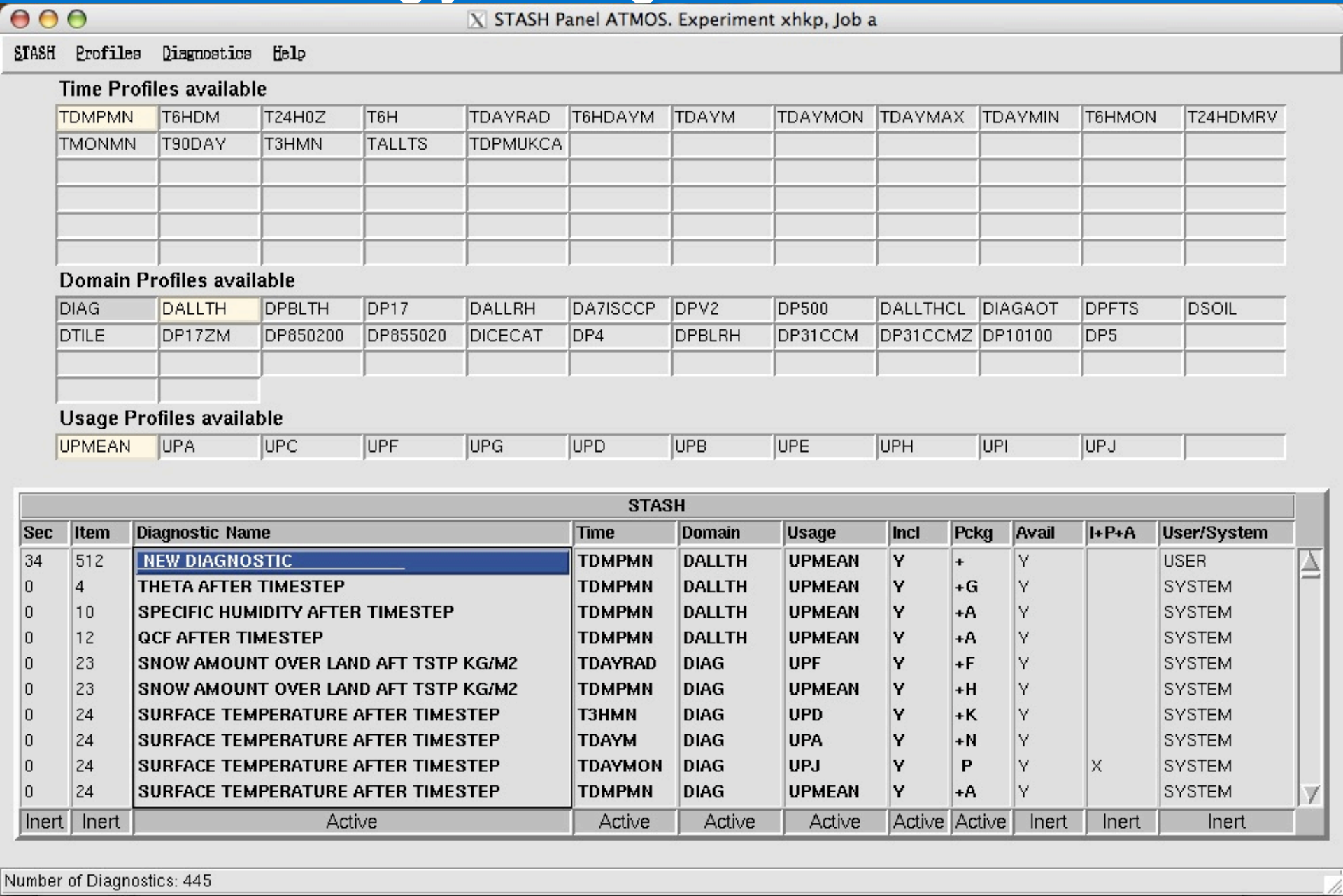




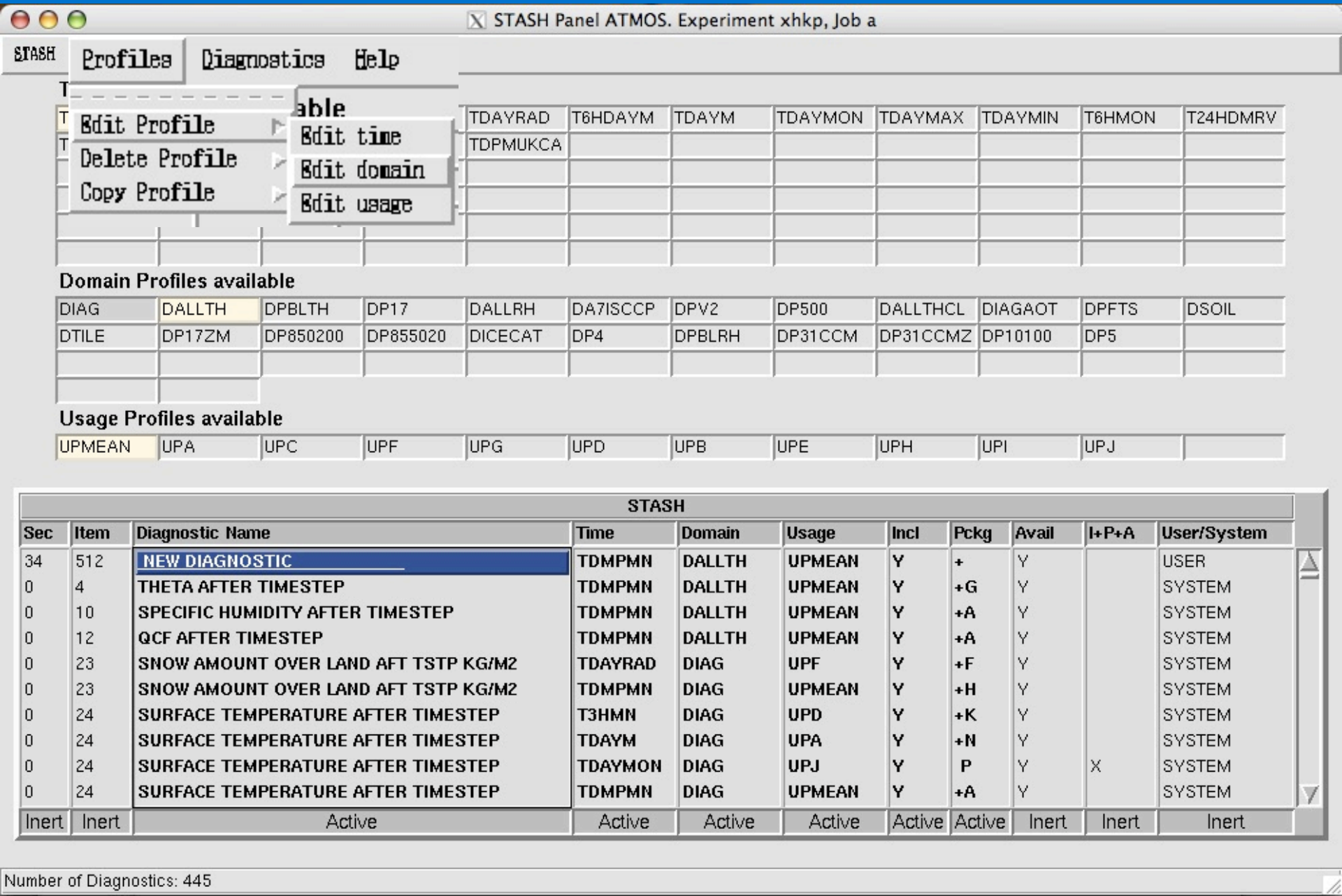
Adding your diagnostic to the UMUI



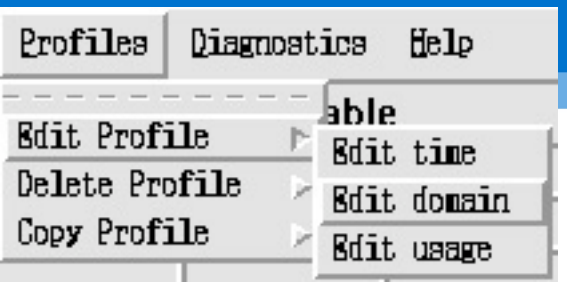
Adding your diagnostic to the UMUI



Domain Profile



Domain Profile



Domain profile specification (Levels) : Job xhkp.a: "UKCA-TropIsop HECToR Phase2b N48L60 QESM-A"

Domain profile name: DALLTH

Select vertical level type:
- Variables derived on a single or unspecified level
- Variables derived on model rho levels (Charney-Philips grid)
- Variables derived on model theta levels (Charney-Philips grid)
- Variables on deep soil levels
- Variables on pressure levels (hPa)
- Variables on geometric height levels (m)
- Variables on constant theta surfaces (K)
- Variables on potential vorticity levels
- Variables on cloud threshold levels (octas)

Specification of levels by:
- Range of model levels
- List of selected model levels

Range starting at (see Level Names Help): ATMOS_BOTTOM — Converts to: 1

Range ending at (see Level Names Help): ATMOS_TOP — Converts to: 60

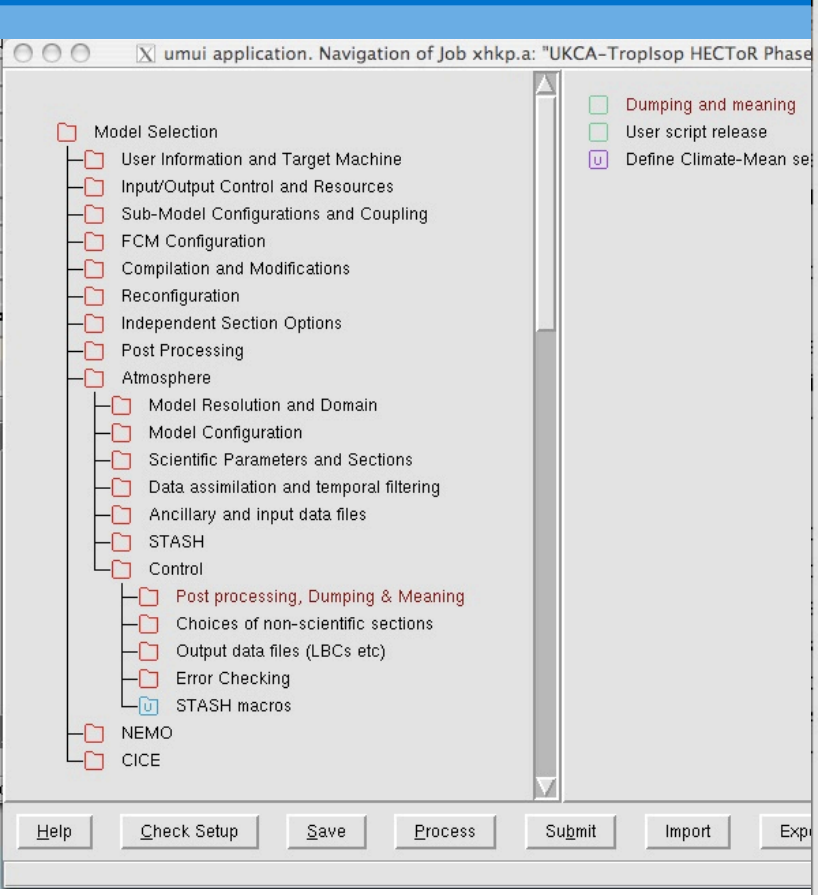
Level Names Help | Help | Abandon changes | Close | PSEUDO | HORIZ | TSERIES

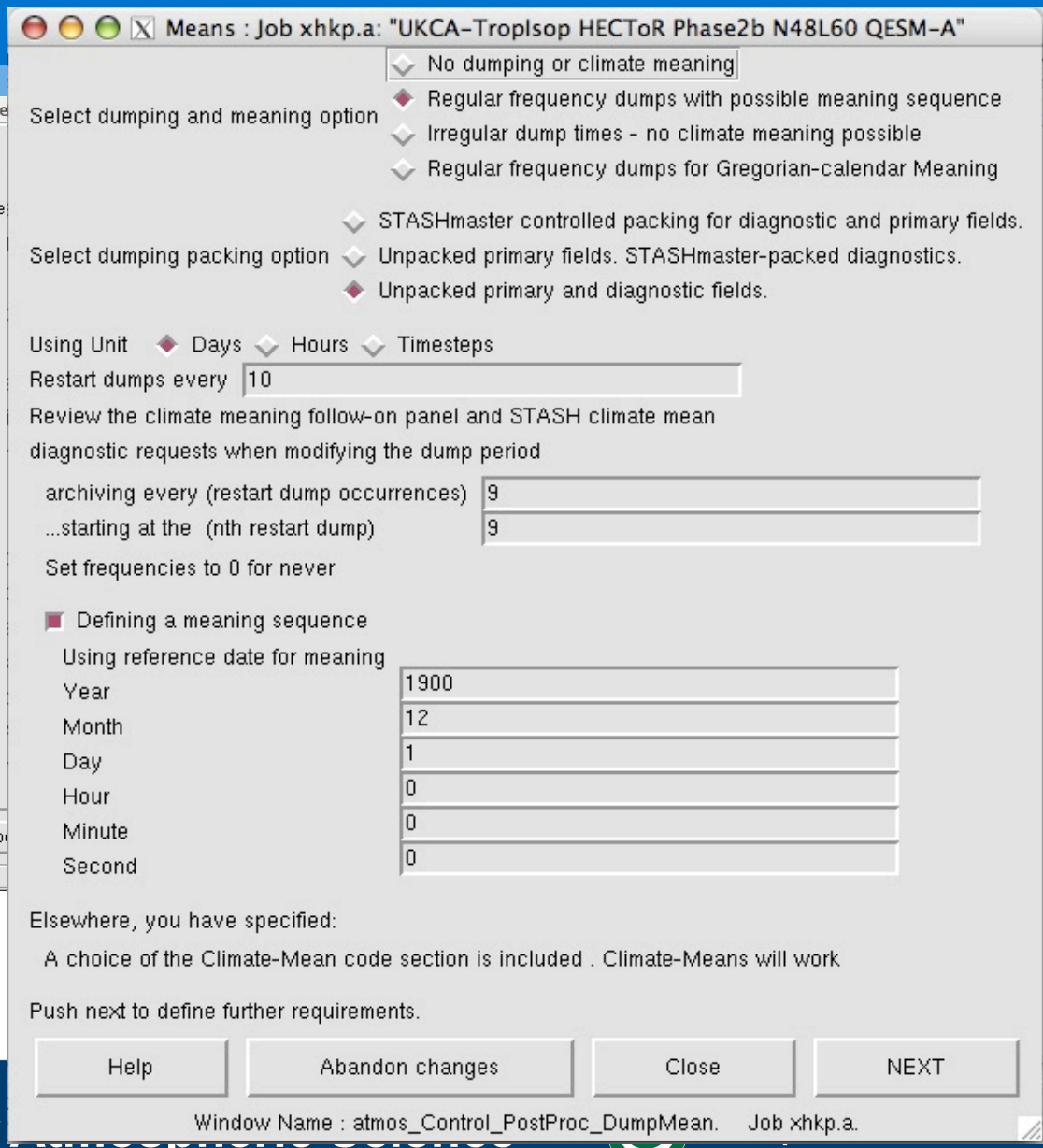
Window Name : atmos_STASH_Domain. Job xhkp.a.

Climate Meaning

- 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

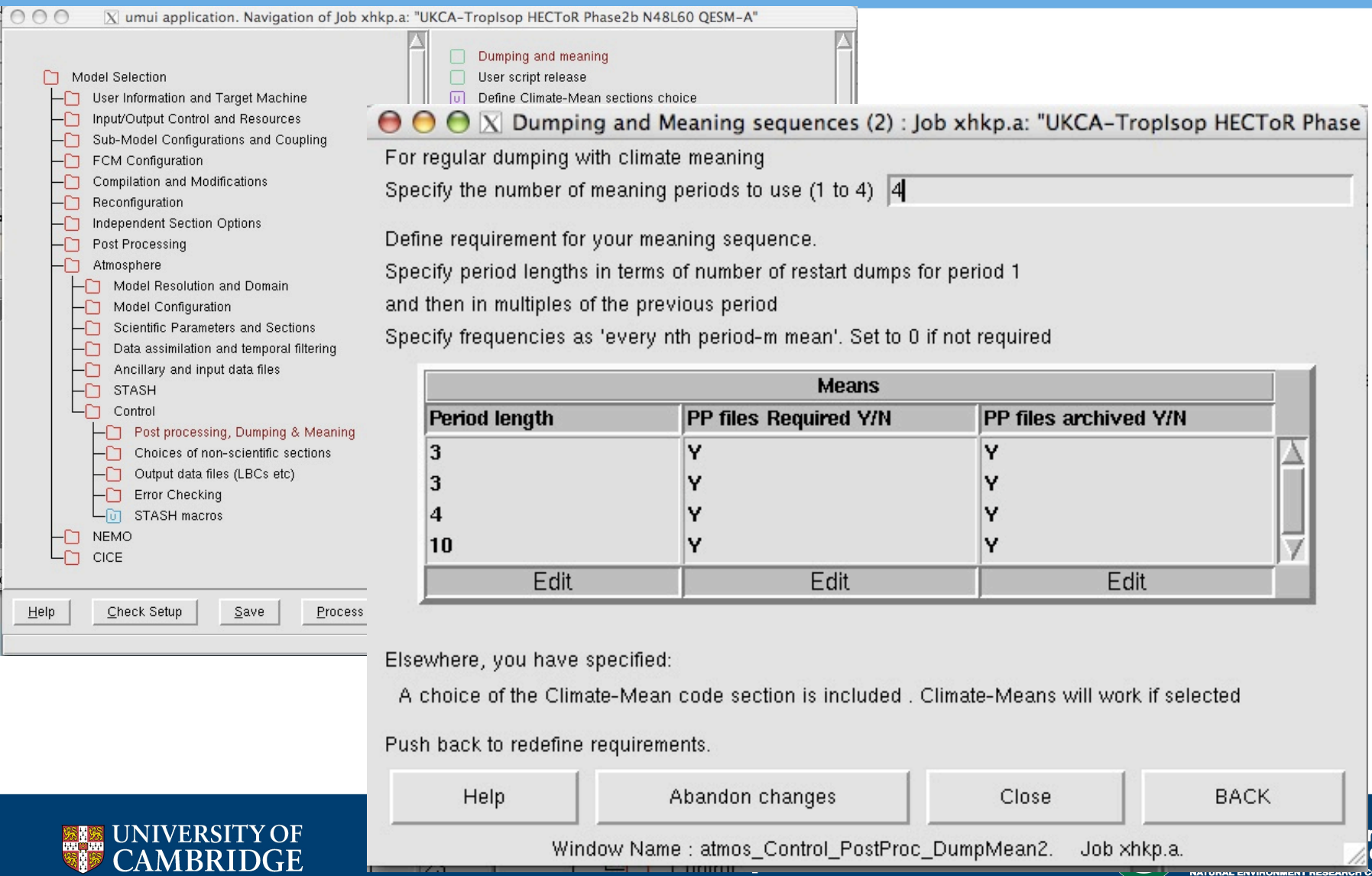
Climate Meaning





Climate Meaning

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



Climate Meaning

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	

Usage Profiles available

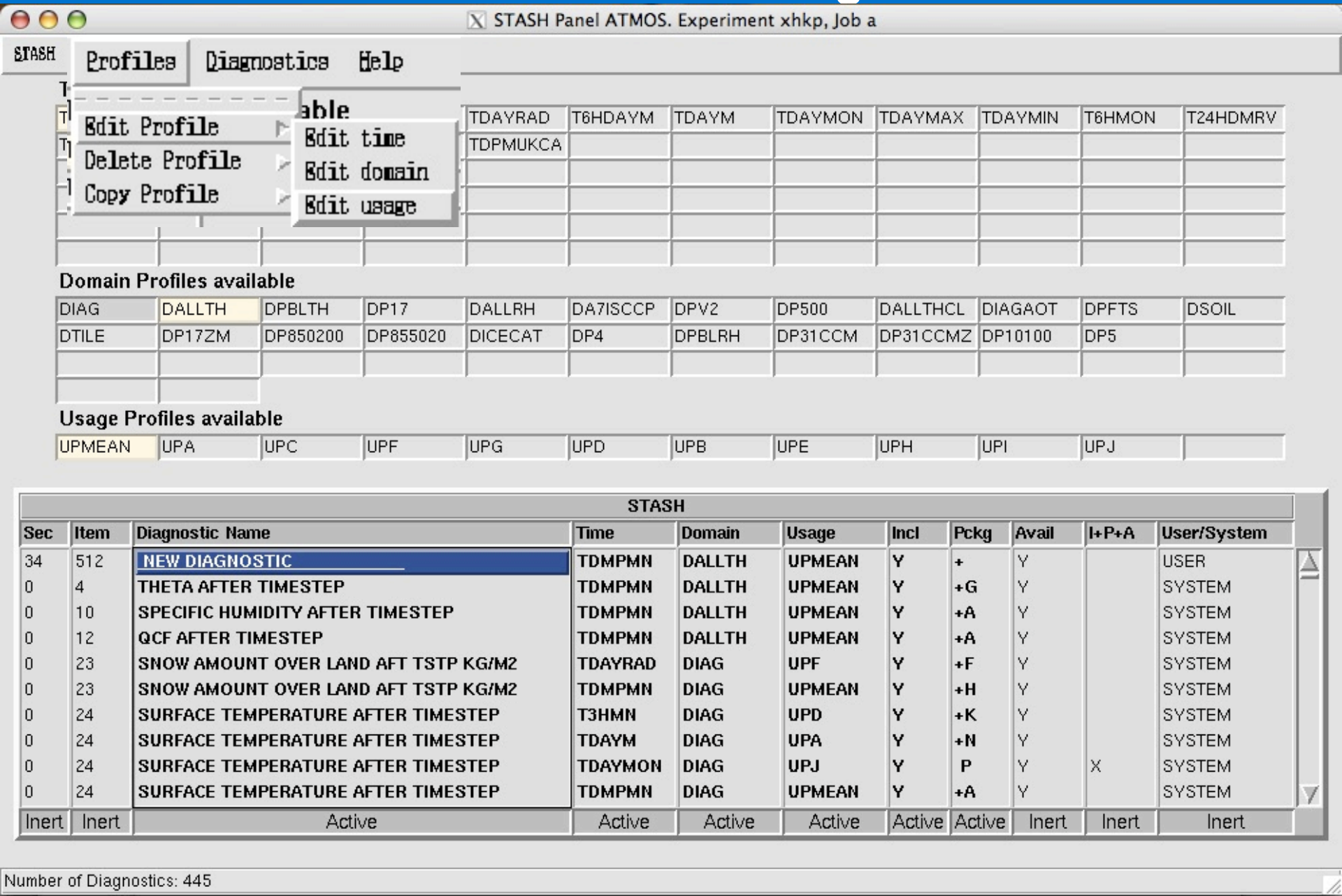
UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

STASH

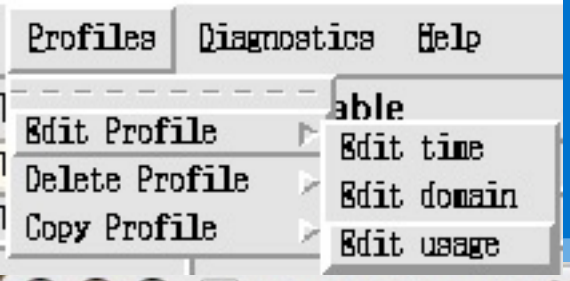
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System
34	512	NEW DIAGNOSTIC	TDMPMN	DALLTH	UPMEAN	Y	+	Y		USER
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	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	T3HMN	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	P	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

Number of Diagnostics: 445

Climate Meaning



Climate Meaning



STASH Usage profile. : Job xhkp.a: "UKCA-Tropisop HECToR Phase2b N48L60 QESM-A"

Usage profile name: UPMEAN

Specify the final destination of the diagnostic

- Dump store with user specified TAG, specify tag below.
- Secondary store with user specified TAG, specify tag below.
- **Dump store with climate mean TAG. Specify meaning periods below**
- PP-file. Specify stream below
- Send mean diagnostic direct to mean PP-file (climate mean sections only)

- Tagged for climate mean period 1
- Tagged for climate mean period 2
- Tagged for climate mean period 3
- Tagged for climate mean period 4

Elsewhere you have set up climate meaning as follows:

Climate meaning is specified

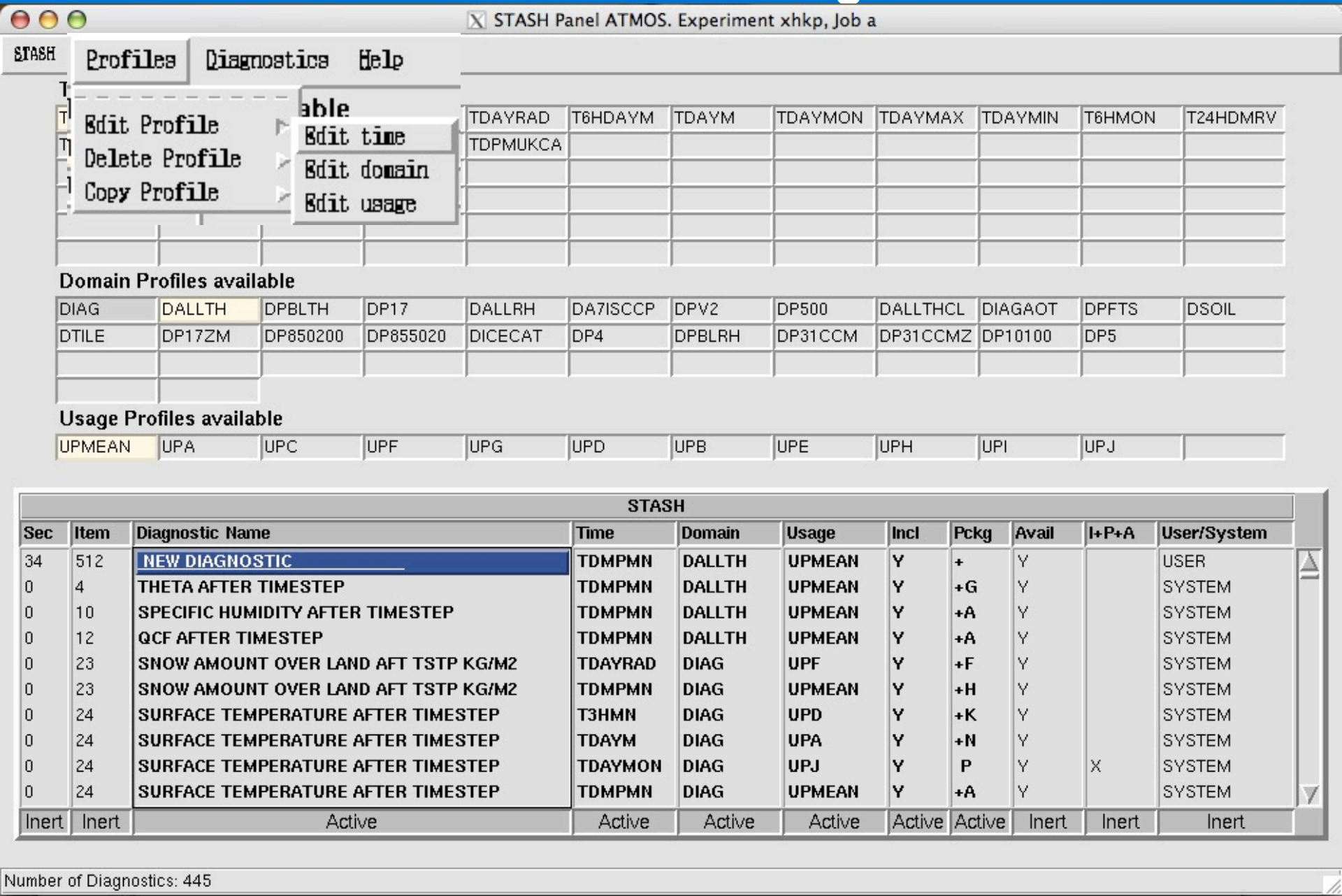
Number of climate mean periods: 4

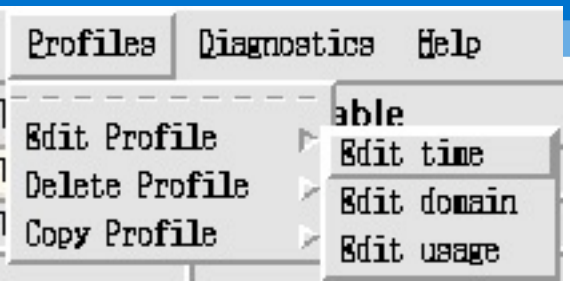
Push FILES to see settings of PP-files to sub-models and reinitialisation.

Help | Abandon changes | Close | FILES

Window Name : atmos_STASH_Usage. Job xhkp.a.

Climate Meaning





Time profile name: TDMPMN

Specify time processing required:
- ◇ No time processing. Field valid at output timesteps.
- ◇ Time accumulation, specify accumulation period and sampling frequency below
- ◆ Time mean, specify meaning period and sampling frequency below
- ◇ Time series, specify recycling period and sampling frequency below
- ◇ Special daily-mean time series. Specify recycling period below.
- ◇ Maximum value in a period, specify period and sampling frequency below
- ◇ Minimum value in a period, specify period and sampling frequency below

Define the meaning period:

Time units: ◇ Days ◇ Hours ◆ Dump periods ◇ Timesteps

Sampling period: 1

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 diagnostic

Specification type: ◆ Regular intervals ◇ Specified List

Time units: ◇ 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
Inert	Inert

Sort

Climate Meaning

- **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

Other output streams

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
  - Reconfiguration
  - Independent Section Options
  - Post Processing

Main Switch + General Questions

Initialization and processing of mean & standard PP files

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-initialised PP files, also specify					
PP File/Unit	Packing profile	Override size	GRIB FORMAT (Y/N)	Periodic Re-init	Period	Starting	Ending	Time Unit	Sub Model	Archiving
PP0/PA/60	5	16000	N	Y	30	0	-1	DA	A	Y
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
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

Window Name : subindep_PostProc_PPInit. Job xipf.a.

Other output streams

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	

Usage Profiles available

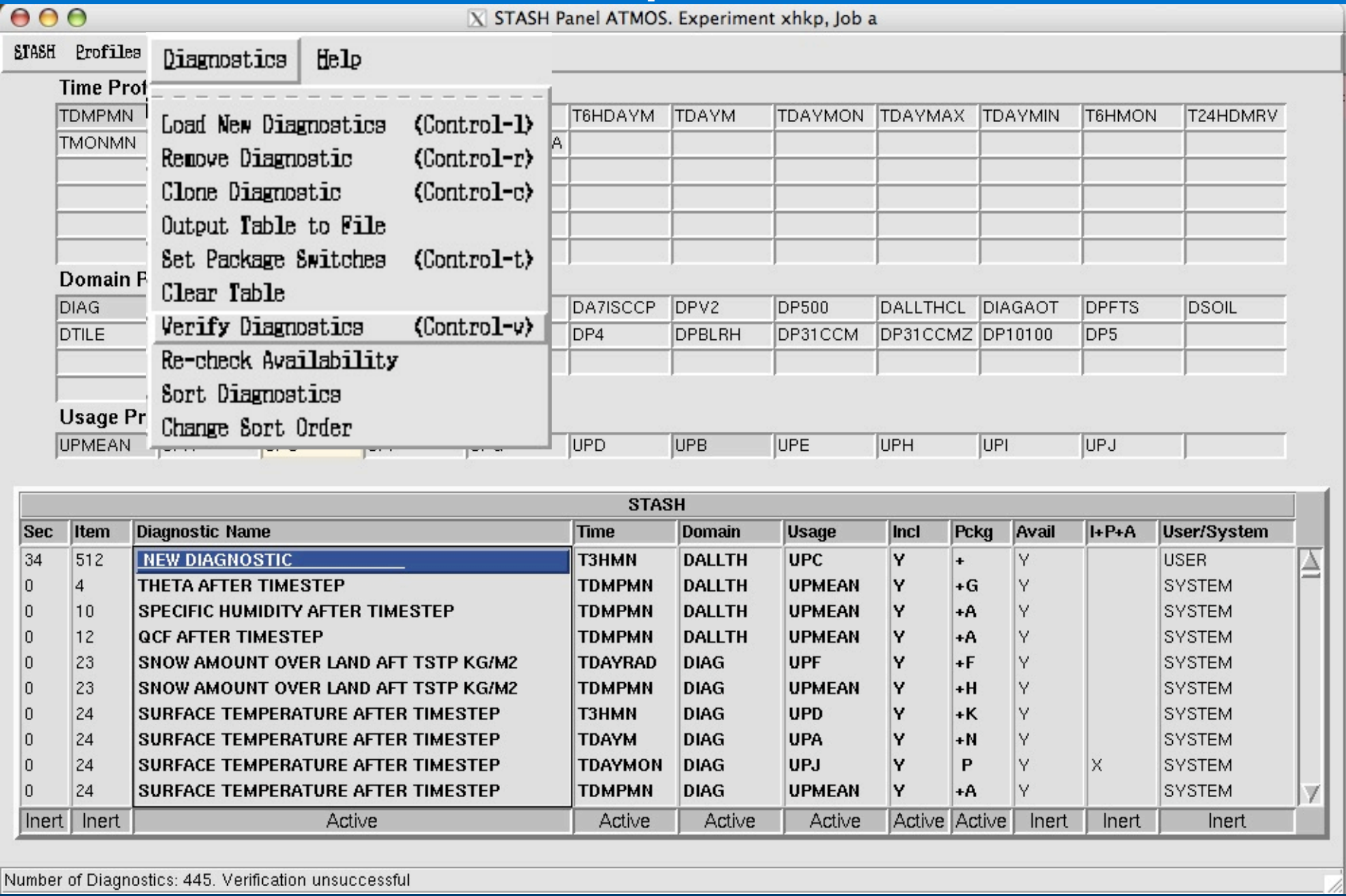
UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

STASH

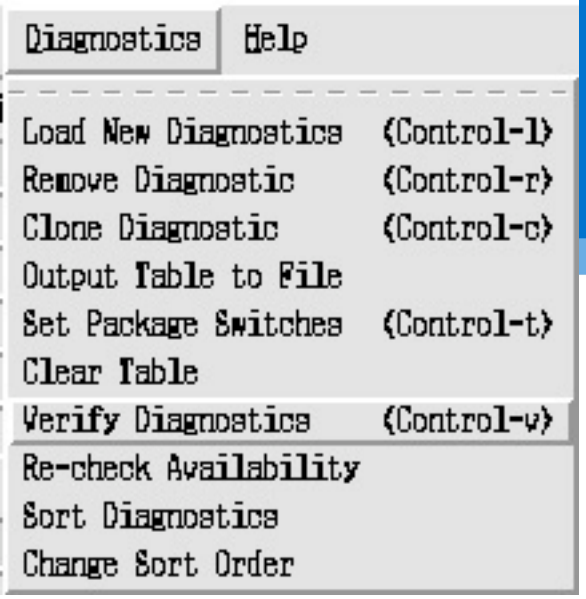
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System
34	512	NEW DIAGNOSTIC	T3HMN	DALLTH	UPC	Y	+	Y		USER
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	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	T3HMN	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	P	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

Number of Diagnostics: 445. Verification unsuccessful

Other output streams



Other output streams



Warning:
You may exceed the maximum number of PP fields per file

Estimated number of PP files to be written:

17190 fields in stream 62
5761 fields in Climate mean Period_1
5761 fields in Climate mean Period_2
5761 fields in Climate mean Period_3
5761 fields in Climate mean Period_4

Maximum allowed is 4096 fields per stream.

Note: ‘field’ is a 2D horizontal field

Other output streams

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
  - Reconfiguration
  - Independent Section Options
  - Post Processing

Main Switch + General Questions

Initialization and processing of mean & standard PP files

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-initialised PP files, also specify					
PP File/Unit	Packing profile	Override size	GRIB FORMAT (Y/N)	Periodic Re-init	Period	Starting	Ending	Time Unit	Sub Model	Archiving
PP0/PA/60	5	16000	N	Y	30	0	-1	DA	A	Y
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
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

Window Name : subindep_PostProc_PPInit. Job xipf.a.

Other output streams

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	

Usage Profiles available

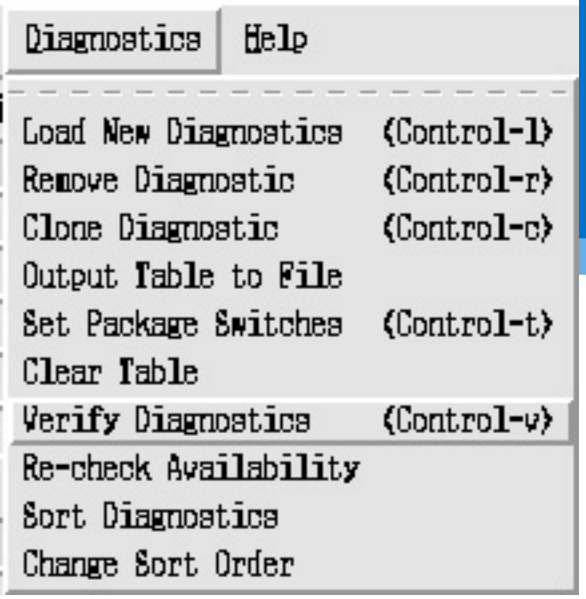
UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

STASH

Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System
34	512	NEW DIAGNOSTIC	T3HMN	DALLTH	UPB	Y	+	Y		USER
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	T3HMN	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	P	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

Number of Diagnostics: 445. Verification unsuccessful

Other output streams



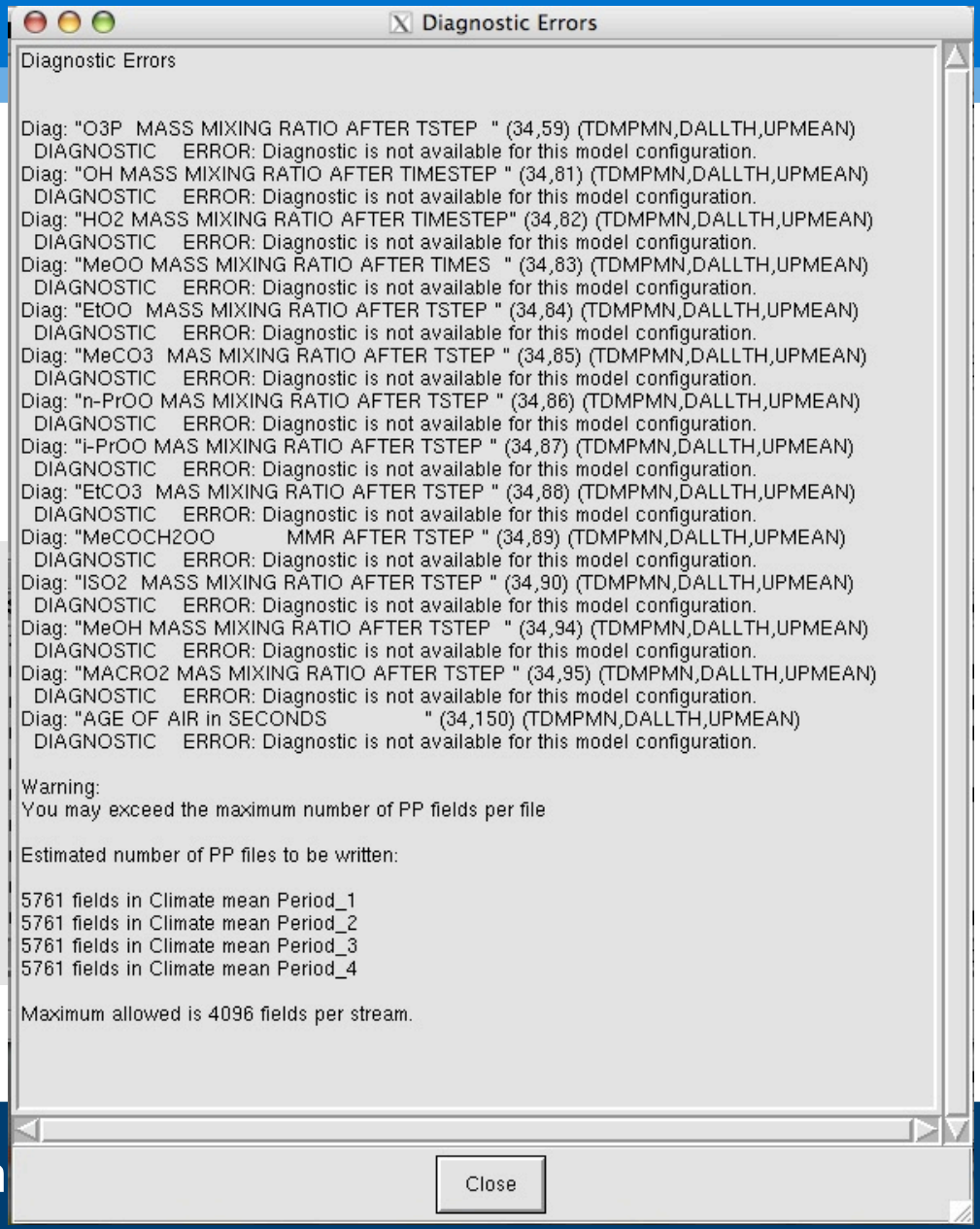
Warning:
You may exceed the maximum number of PP fields per file

Estimated number of PP files to be written:

5761 fields in Climate mean Period_1
5761 fields in Climate mean Period_2
5761 fields in Climate mean Period_3
5761 fields in Climate mean Period_4

Maximum allowed is 4096 fields per stream.

Note: 'field' is a 2D horizontal field



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

Diag: " NEW DIAGNOSTIC " (34,512) (T3HMN,DALLRH,UPB)
DOMAIN PROF ERROR: Use profile on model theta-levels.

Which levels?

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	

Usage Profiles available

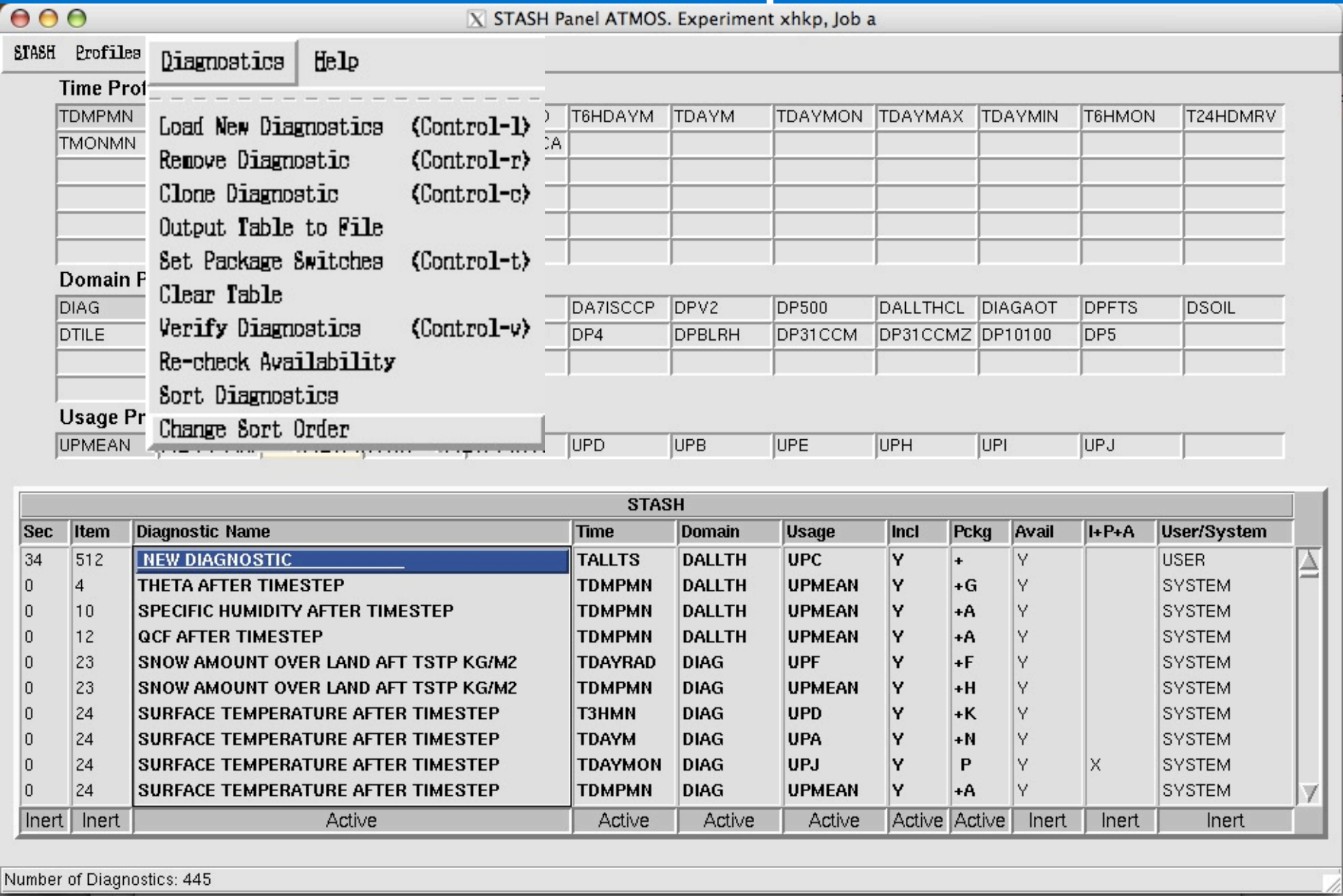
UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

STASH

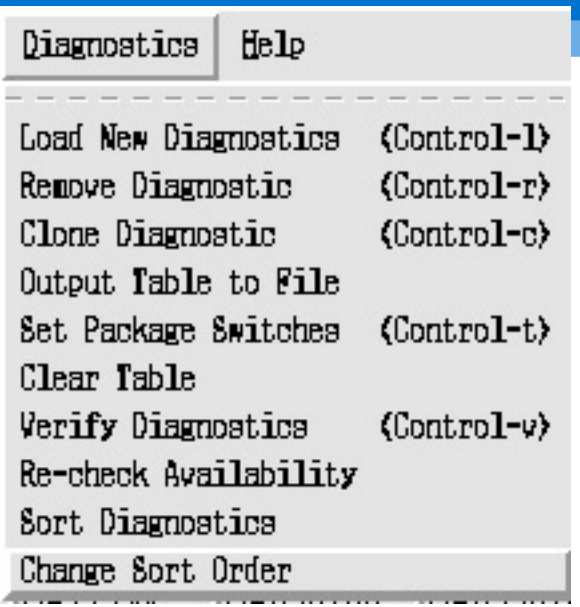
Sec	Item	Diagnostic Name	Time	Domain	Usage	Incl	Pckg	Avail	I+P+A	User/System
34	512	NEW DIAGNOSTIC	T3HMN	DALLRH	UPB	Y	+	Y		USER
0	4	THETA AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+G	Y		SYSTEM
0	10	SPECIFIC HUMIDITY AFTER TIMESTEP	TDMPMN	DALLTH	UPMEAN	Y	+A	Y		SYSTEM
0	12	QCF AFTER TIMESTEP	TDMPMN	DALLTH	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	T3HMN	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	P	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

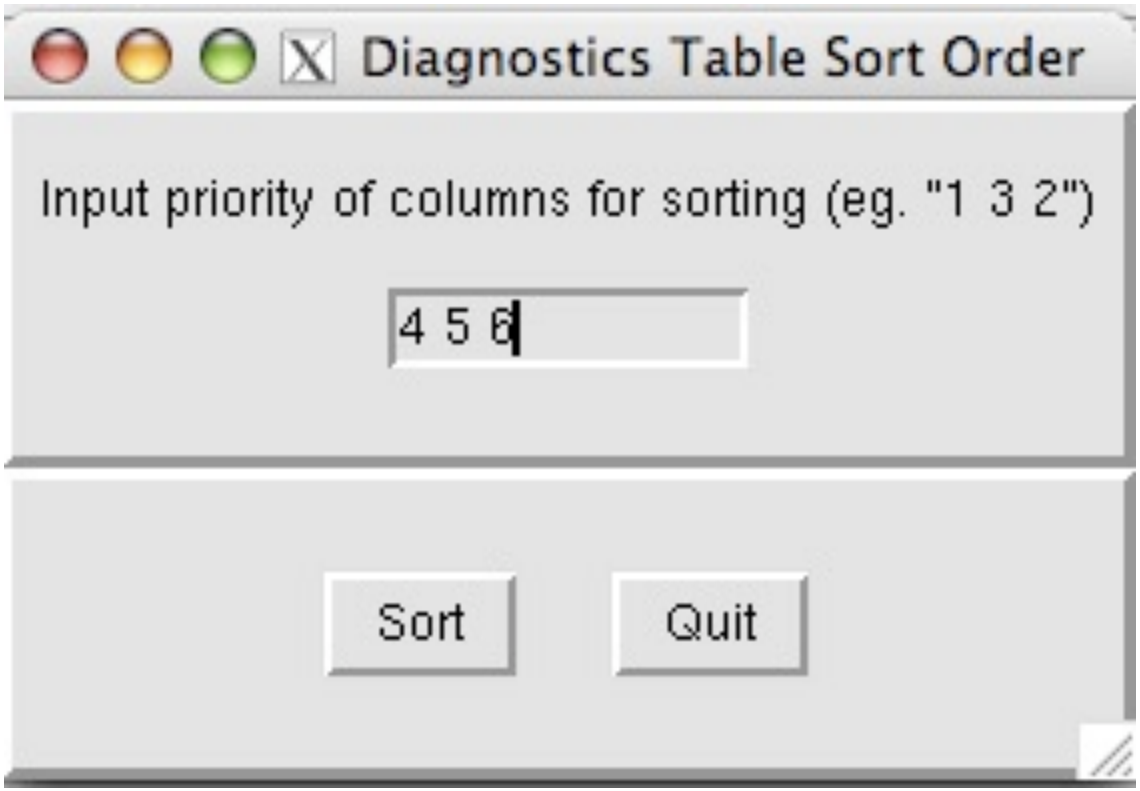
Number of Diagnostics: 445. Verification unsuccessful

Other useful options

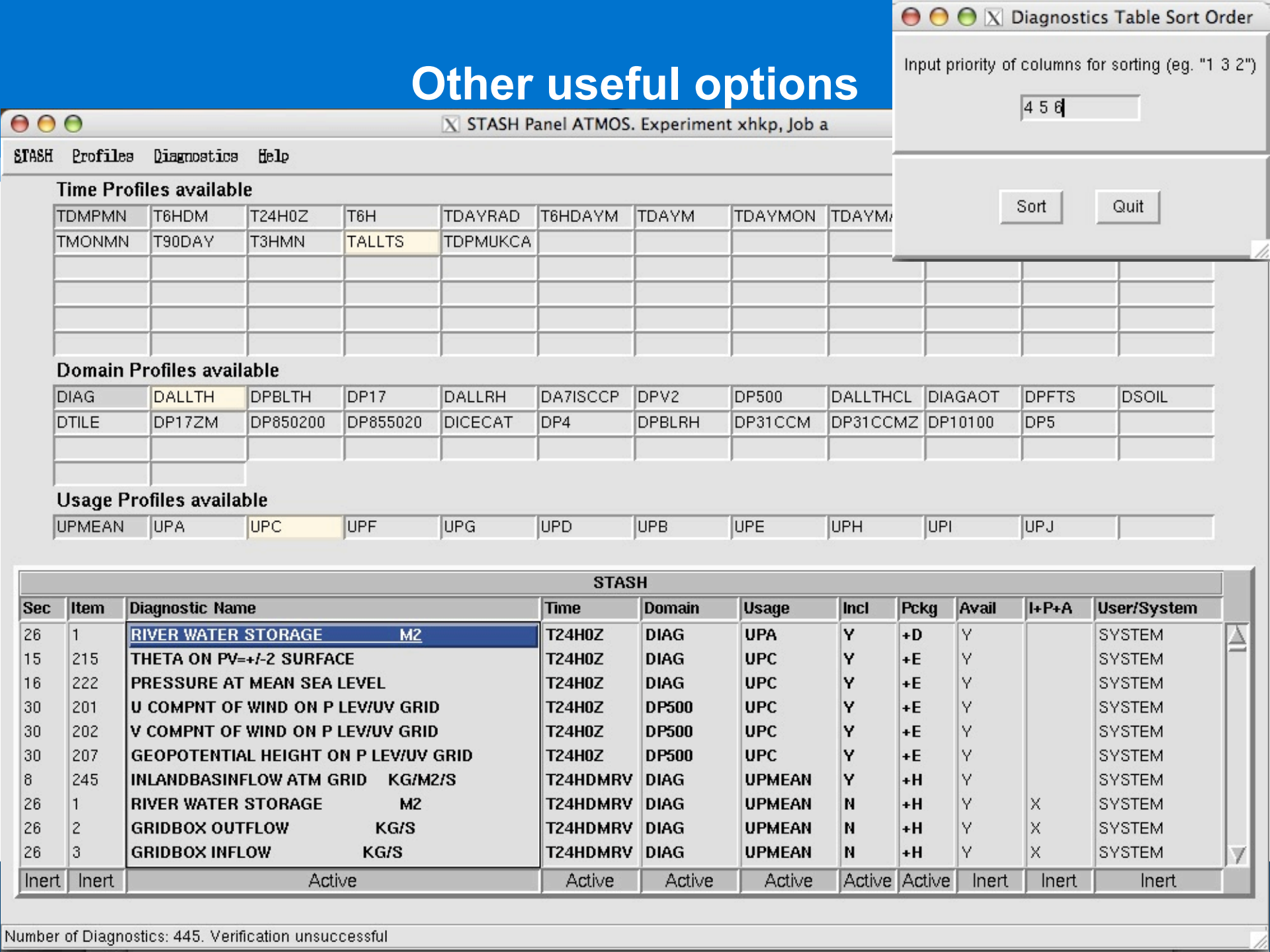


Other useful options

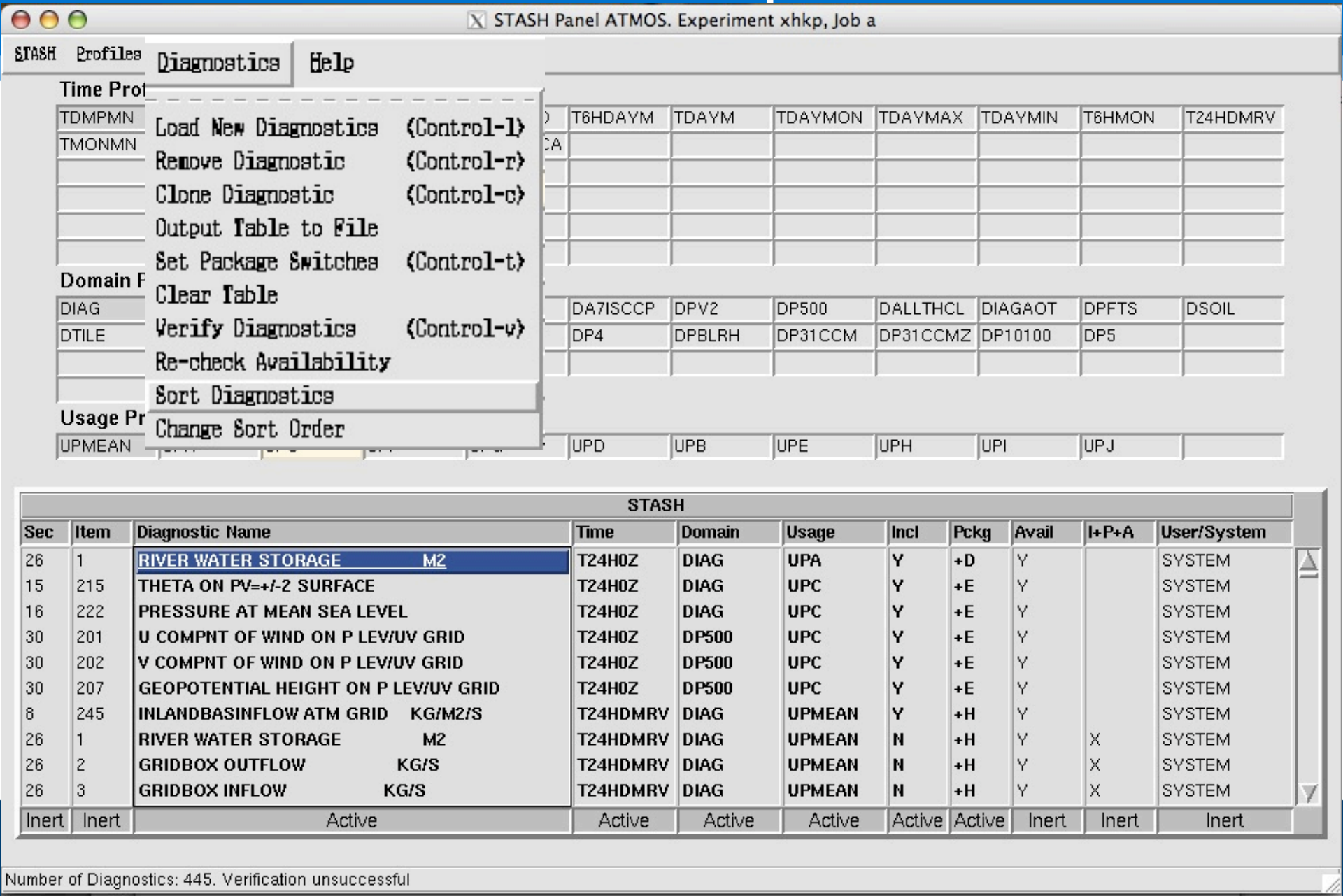




Other useful options



Other useful options



Other useful options

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	

Usage Profiles available

UPMEAN	UPA	UPC	UPF	UPG	UPD	UPB	UPE	UPH	UPI	UPJ	

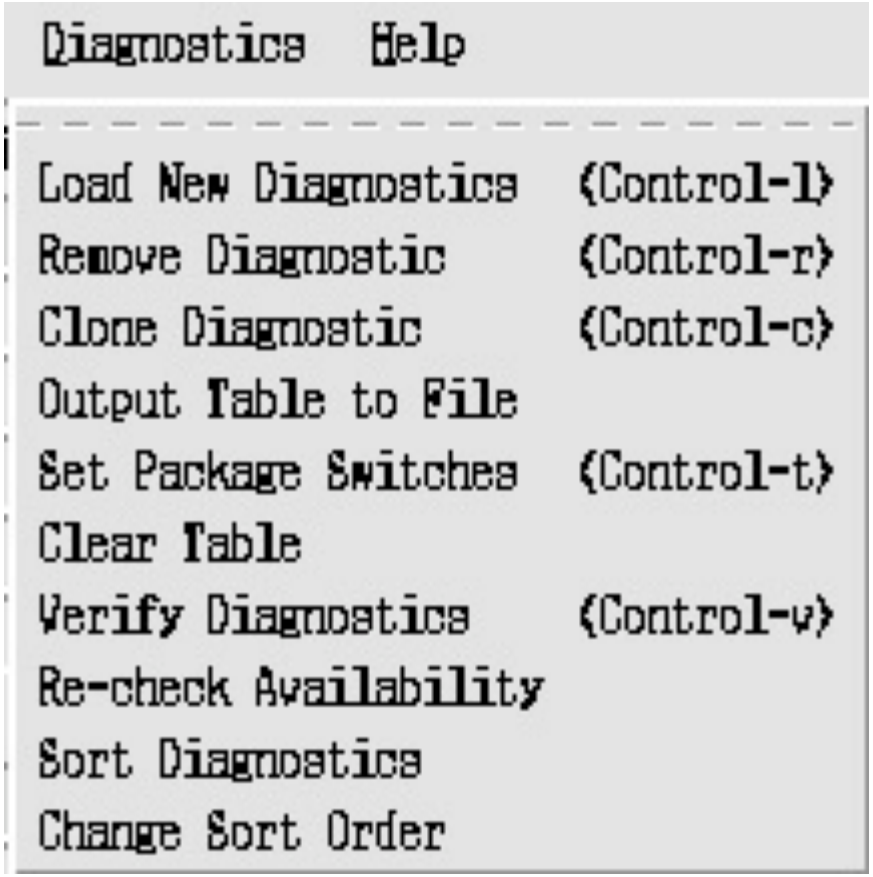
STASH

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
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	T3HMN	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	P	Y	X	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

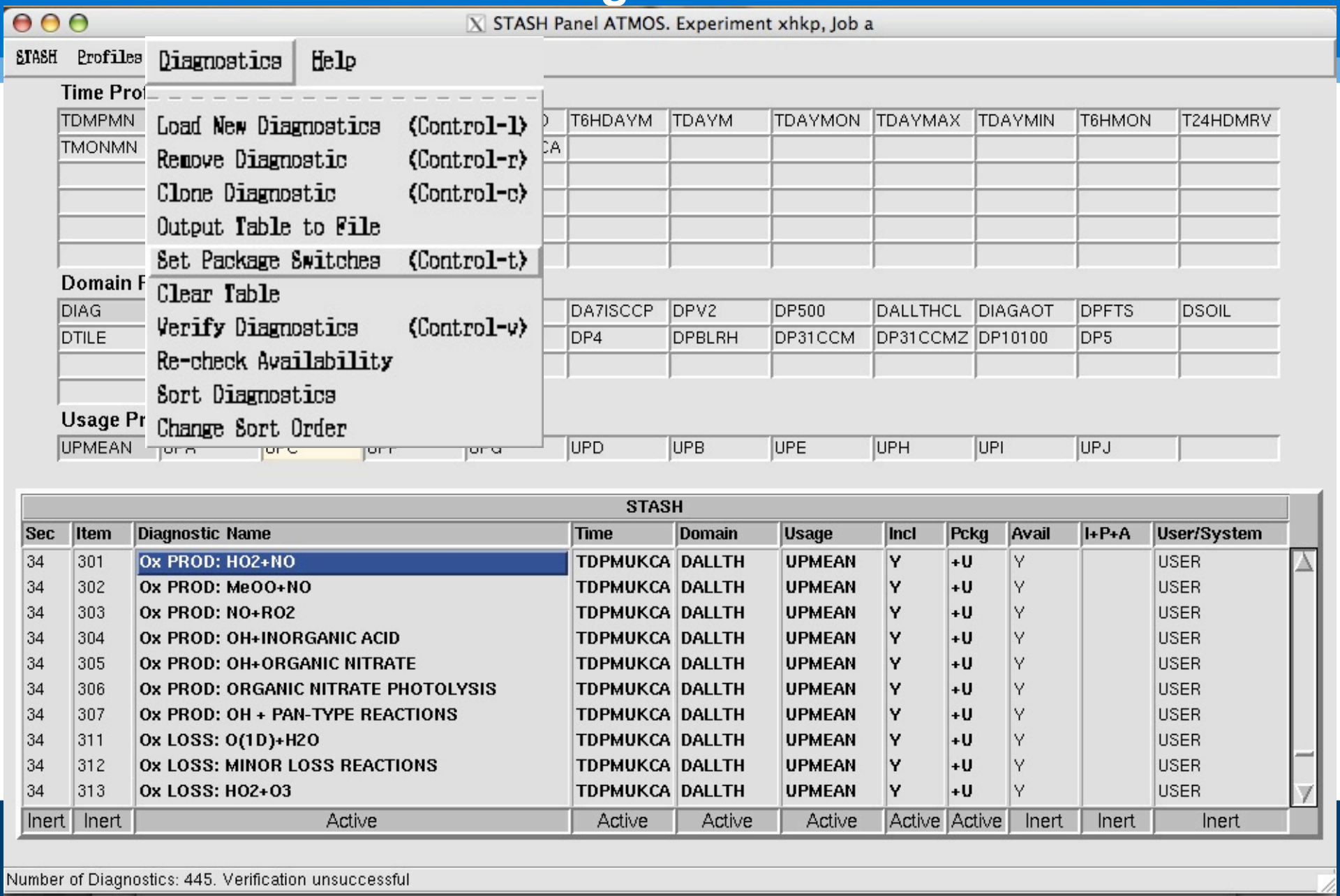
Number of Diagnostics: 445. Verification unsuccessful

Other useful options

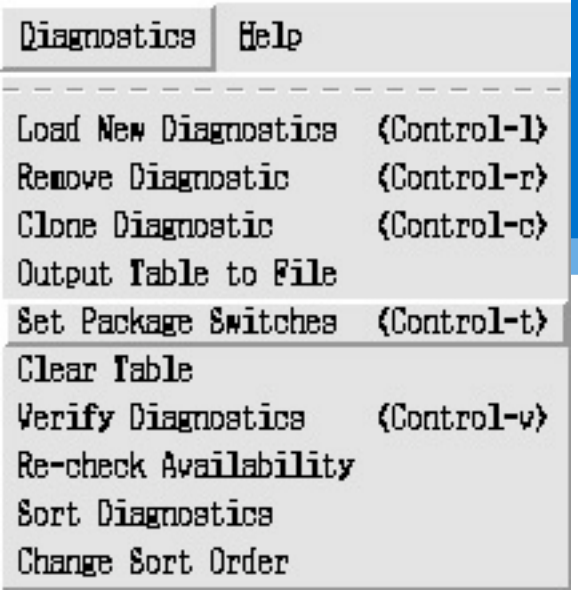
- You can also:
  - Output table to file (very useful for comparing STASH between jobs)
  - Set package switches
    - A set of diagnostics can be grouped together and turned on or off from the package table

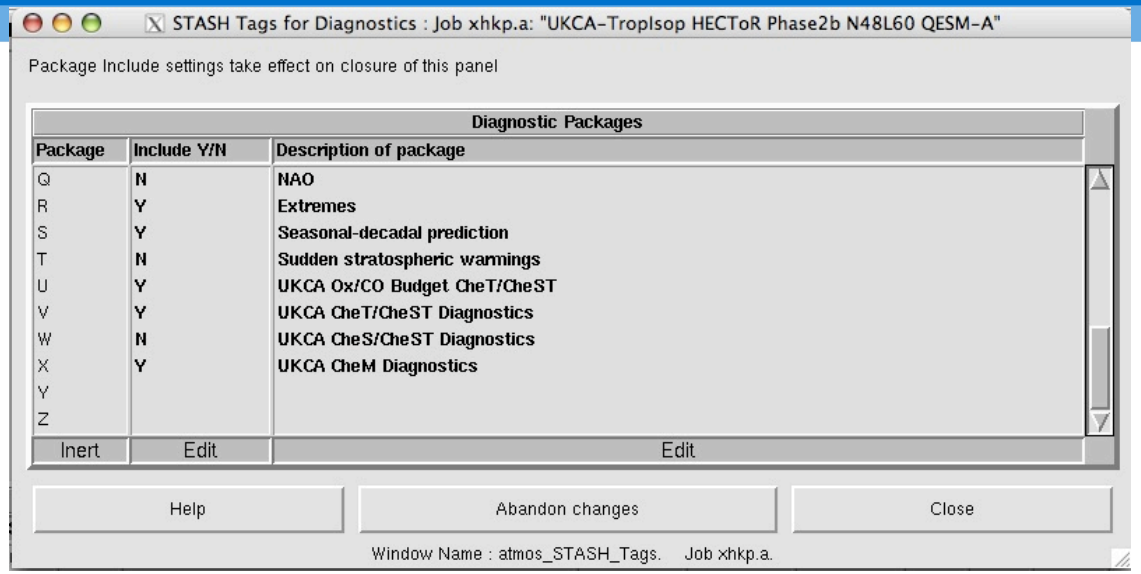


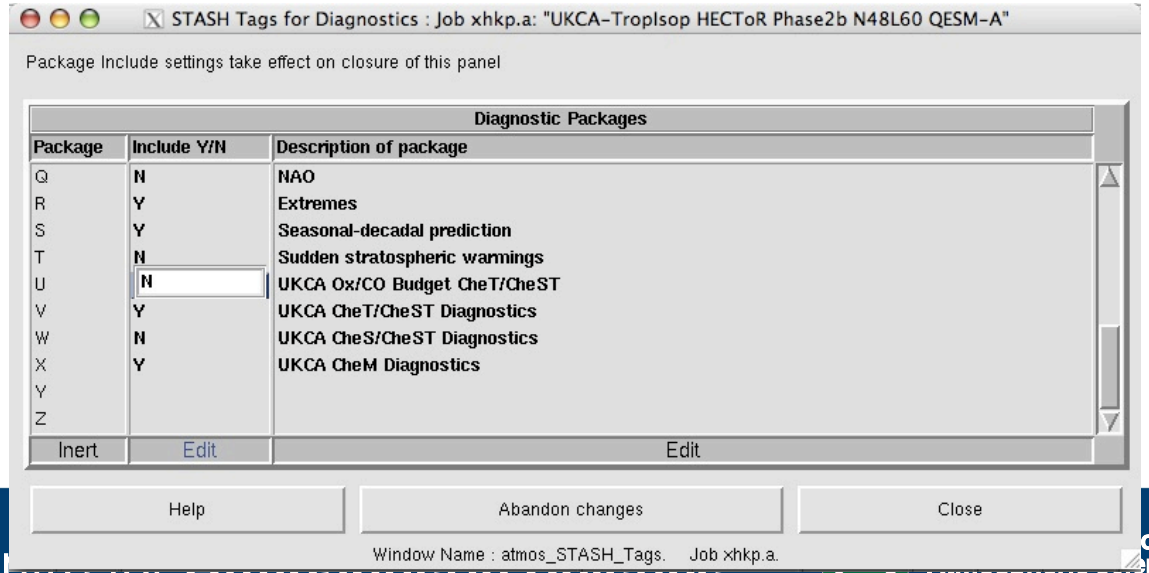
Package Switches



Package Switches







Package Switches

Note: May need to close STASH window and re-open!

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	

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
34	301	Ox PROD: HO2+NO	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	302	Ox PROD: MeOO+NO	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	303	Ox PROD: NO+RO2	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	304	Ox PROD: OH+INORGANIC ACID	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	305	Ox PROD: OH+ORGANIC NITRATE	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	306	Ox PROD: ORGANIC NITRATE PHOTOLYSIS	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	307	Ox PROD: OH + PAN-TYPE REACTIONS	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	311	Ox LOSS: O(1D)+H2O	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	312	Ox LOSS: MINOR LOSS REACTIONS	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
34	313	Ox LOSS: HO2+O3	TDPMUKCA	DALLTH	UPMEAN	Y	U	Y	X	USER
Inert	Inert	Active	Active	Active	Active	Active	Active	Inert	Inert	Inert

Number of Diagnostics: 445