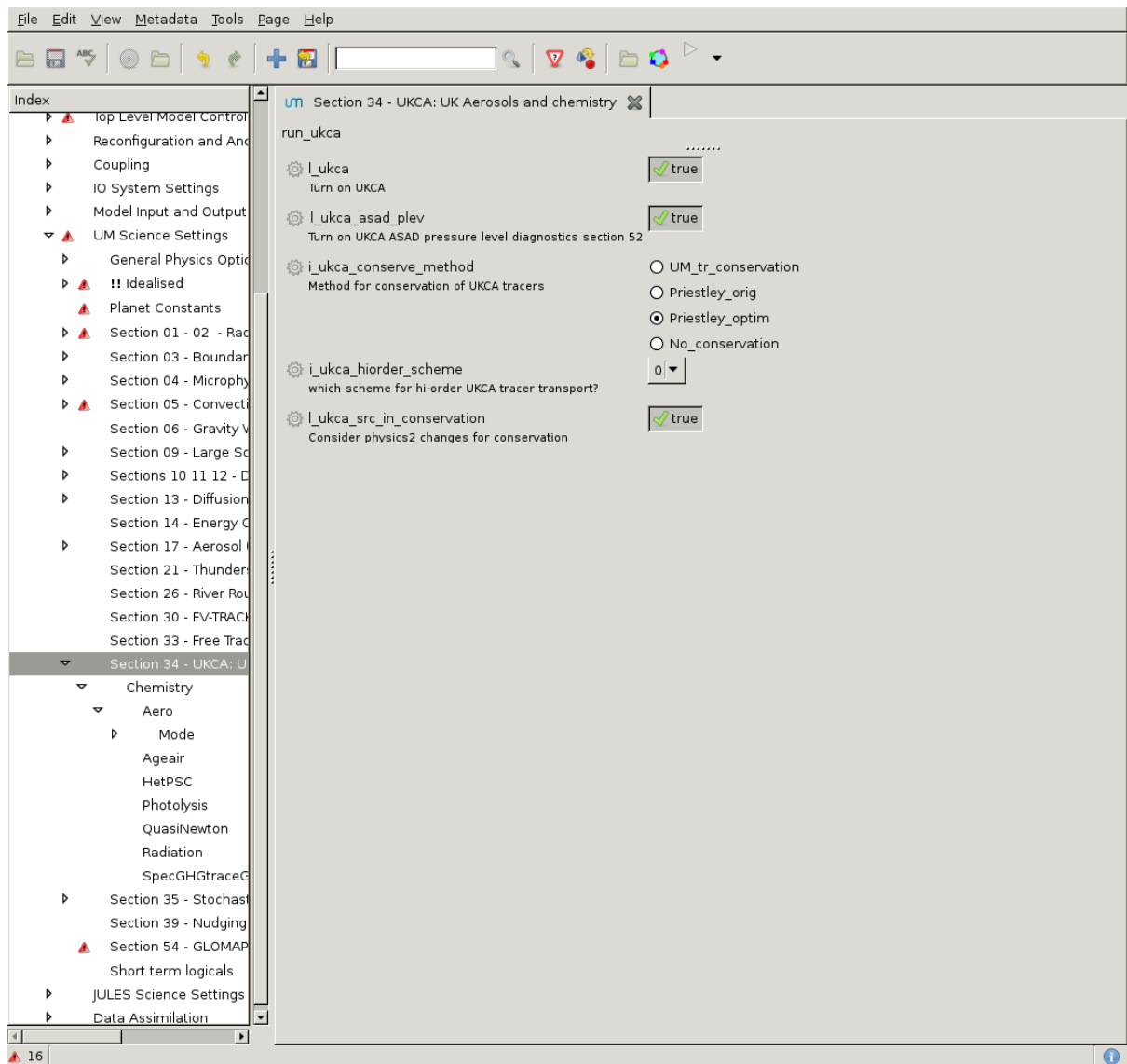




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um Chemistry

i_ukca_chem Stratospheric+Tropospheric (51)
UKCA Chemistry scheme

chem_timestep 3600
Chemistry timestep (seconds)

l_ukca_asad_columns true
Call ASAD Newton-Raphson solver by columns

l_ukca_chem_plev true
Turn on UKCA CHEM pressure level diagnostics section 51

l_ukca_h2o_feedback false
Switch on water feedback from chemistry

l_ukca_ibvoc false
Turn on the interactive BVOC emissions (coupled to JULES).

l_ukca_intdd true
UKCA interactive dry deposition scheme

l_ukca_ddep_lev1 false
Apply dry deposition losses only in level 1

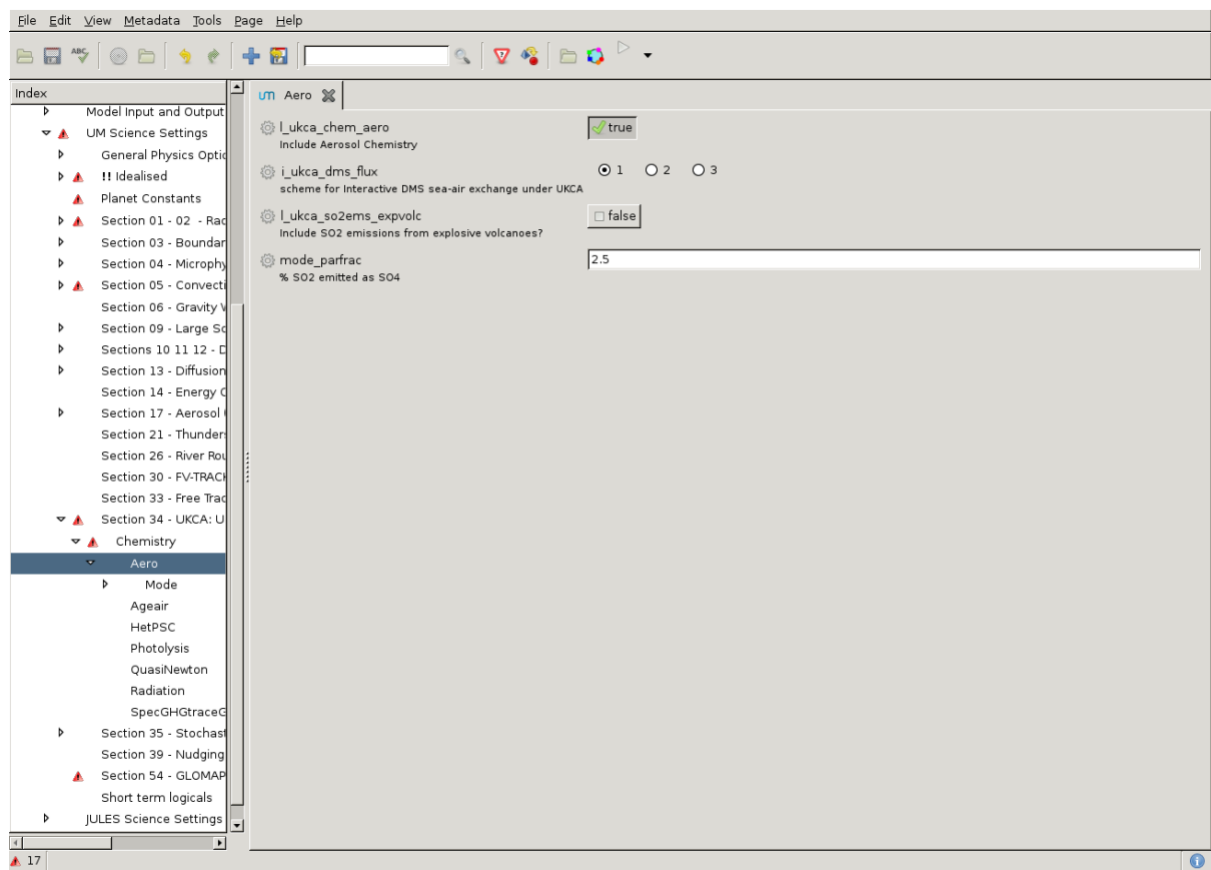
l_ukca_linox_scaling false
Equally distribute Lightning NOx emissions using LOG(p)

l_ukca_prescribch4 false
Use prescribed surface CH4 concentrations

l_ukca_qch4inter false
Interactive wetland CH4 emissions

lightnox_scale_fac 0.5
Li-NOx emiss scale factor

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um Mode

☒ l_ukca_mode
UKCA-GLOMAP-mode aerosol scheme

i_mode_nzts
Number of substeps for Nucleation/Sedimentation

i_mode_setup
Set Aerosol Species and Modes

☒ l_mode_bhn_on
Include binary homogenous sulphate nucleation

☐ l_mode_bln_on
Include Boundary Layer sulphate nucleation

☐ l_ukca_sfix
Calculate CCN at fixed super saturation

☐ l_ukca_trophet
Tropospheric heterogeneous chemistry

mode_activation_dryr
Activation dry radius in nm

mode_aitsol_cvscav
Scavenging fraction of Aitken soluble mode aerosol in convective plume

mode_incl_d_so2_rfrac
Wet removal fraction of in-cloud oxidised SO2

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CoupleRadiationCloud

- ☒ l_ukca_radaer
Direct effect of MODE aerosols in radiation scheme
- ☒ l_ukca_radaer_substrat
Sulphuric acid aerosol in stratosphere
- ukcaaclw
LW file: aitken and insol acc modes
- ukcaacsw
SW file: aitken and insol acc mode
- ukcaanlw
LW file: soluble accumulation mode
- ukcaansw
SW file: soluble accumulation mode
- ukcacrwlw
LW file: coarse-mode
- ukcacrsw
SW file: coarse-mode
- ukcaprec
File of pre-computed values
- ☒ l_ukca_aie1
1st Indirect Effect of MODE aerosols (on radiation)
- ☒ l_ukca_aie2
2nd Indirect Effect of MODE aerosols (on precip.)
- ☒ l_ukca_arg_act
Calculate Cloud Droplet Number
using Abdul-Razzak and Ghan Activation Method

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EmissionsMode

☒ l_ukca_primbcoc	Primary BC/OC Emissions	☒ true
☒ l_bcoc_bf	Biofuel BC/OC	☒ true
☒ l_bcoc_bm	Biomass burning BC/OC	☒ true
☒ l_bcoc_ff	Fossil fuel BC/OC	☒ true
☐ l_ukca_prim_moc	Primary marine organic emissions	☐ false
☒ l_ukca_scale_biom_aer_ems	Option to scale biomass burning emissions of OC and BC aerosol	☒ true
☒ biom_aer_ems_scaling	Scaling factor for biomass burning emissions of OC and BC aerosol	2.0
☒ l_ukca_scale_soa_yield	Option to scale production of Secondary Organic Aerosol (SOA)	☒ true
☒ l_ukca_scale_soa_yield	Option to scale production of Secondary Organic Aerosol (SOA)	☒ true
☒ soa_yield_scaling	Scaling factor for production of Secondary Organic Aerosol (SOA)	2.0
☒ l_ukca_primss	Primary Seasalt Emissions	☒ true
☒ l_ukca_primsu	Primary Sulphate Emissions	☒ true
☒ ukca_em_dir	Directory pathname for NetCDF emission files	'\$UMDIR/ancil/atmos/n48e/ukca_emiss'
☒ ukca_em_files	Names of NetCDF emission files	+ gfed3.1/clim_2002_2011/v2/ukca_emiss_BC_biomass.nc gfed3.1/clim_2002_2011/v2/ukca_emiss_OC_biomass.nc andres_kasgnoc/v1/ukca_emiss_SO2_nat.nc cmip5/2000/v1/ukca_emiss_Monoterp.nc cmip5/1970_2010/v1/ukca_emiss_SO2_low.nc cmip5/2000/v1/ukca_emiss_BC_fossil.nc cmip5/2000/v1/ukca_emiss_BC_biofuel.nc cmip5/2000/v1/ukca_emiss_OC_fossil.nc cmip5/2000/v1/ukca_emiss_OC_biofuel.nc cmip5/1970_2010/v1/ukca_emiss_SO2_high.nc cmip5/1970_2010/v1/ukca_emiss_DMS.nc cmip5/1970_2010/v1/ukca_emiss_NH3.nc cmip5/2000/v1/ukca_emiss_NO_aircraft.nc cmip5/2000/v1/ukca_emiss_HCHO.nc cmip5/2000/v1/ukca_emiss_CH4.nc cmip5/2000/v1/ukca_emiss_MeCHO.nc cmip5/2000/v1/ukca_emiss_C3H8.nc cmip5/2000/v1/ukca_emiss_NO.nc cmip5/2000/v1/ukca_emiss_C2H6.nc cmip5/2000/v1/ukca_emiss_Me2CO.nc cmip5/2000/v1/ukca_emiss_C5H8.nc cmip5/2000/v1/ukca_emiss_NVOC.nc cmip5/2000/v1/ukca_emiss_CO.nc
☒ l_ukca_scale_seadms_ems	Option to scale marine DMS emissions	☐ false

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um Ageair

☒ true

☒ Reset by level

☐ Reset by height

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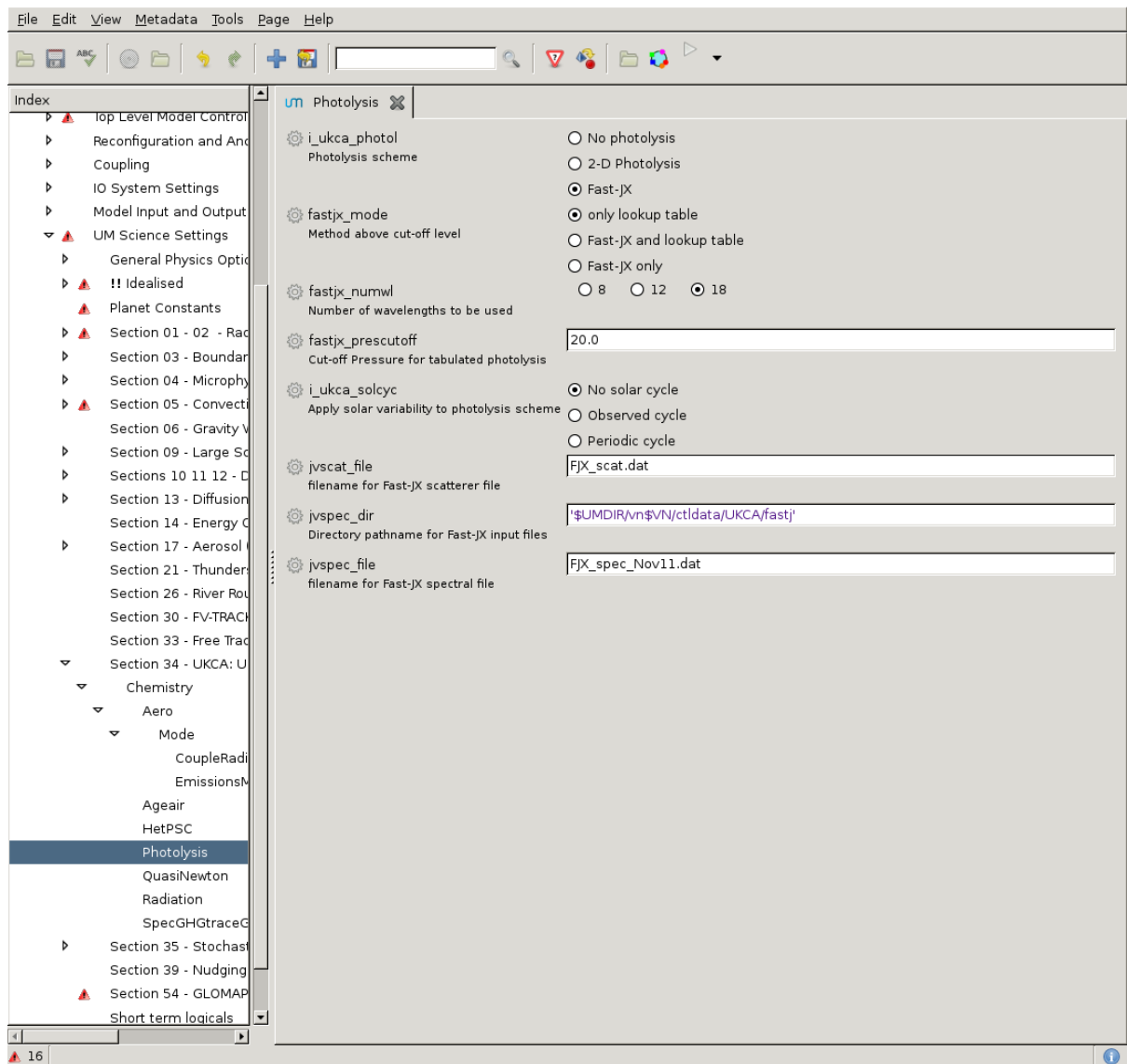
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HetPSC

- ☒ **l_ukca_sa_clim**
Use climatological Aerosol for Surface Area
- ☒ **l_ukca_het_psc**
Switch on Heterogeneous/PSC chemistry
- ☐ **l_ukca_limit_nat**
Limit NAT PSCs (Type 1) formation
- dir_strat_aer**
Directory containing climatological aerosol file
- file_strat_aer**
File containing climatological aerosol data
- ☒ **l_ukca_use_background_aerosol**
Use a cyclic, monthly-varying 'background' aerosol field instead of timeseries

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QuasiNewton

l_ukca_quasinewton ☐ false

Use quasi-Newton method in Newton-Raphson solver step

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um Radiation

	l_ukca_radch4	☒ true
	UKCA CH4 in radiation scheme	
	l_ukca_radf11	☐ false
	UKCA CFC-11 in radiation scheme	
	l_ukca_radf113	☐ false
	UKCA CFC-113 in radiation scheme	
	l_ukca_radf12	☐ false
	UKCA CFC-12 in radiation scheme	
	l_ukca_radf22	☐ false
	UKCA HCFC-2 in radiation scheme	
	l_ukca_radn2o	☒ true
	UKCA N2O in radiation scheme	
	l_ukca_rado3	☒ true
	UKCA O3 in radiation scheme	

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um SpecGHGtraceGases

i_ukca_scenario Choose where to take CO2,N2O,CH4, and CFC concentrations

☒ UM settings

☐ WMO A1(b)

☐ RCP file

ukca_ccl4mmr CCl4 as MMR 5.303e-10

ukca_cfc115mmr CFC115 as MMR 4.584e-11

ukca_ch2br2mmr CH2Br2 as MMR 1.802e-11

ukca_cosmmr COS as MMR 1.000e-9

ukca_h1202mmr H1202 as MMR 3.788e-13

ukca_h1211mmr H1211 as MMR 2.225e-11

ukca_h1301mmr H1301 as MMR 1.363e-11

ukca_h2402mmr H2402 as MMR 3.765e-12

ukca_hcfc141bmmr HCFC141b as MMR 4.092e-11

ukca_hcfc142bmmr HCFC142b as MMR 3.637e-11

ukca_mebrmmr MeBr as MMR 3.009e-11

ukca_meccl3mmr MeCCl3 as MMR 2.775e-10

ukca_mec1mmr MeCl as MMR 9.378e-10

l_ukca_set_trace_gases Specify Values for Trace Gases ☒ true

ukca_h2mmr H2 as MMR 3.453e-08

ukca_n2mmr N2 as MMR 7.547e-01

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