**On the set up and running of NEMESIS and the processing of the outputs**

Log into ALICE

**ssh -XY jh852@alice2.le.ac.uk**

Navigate to working nemesis directory, copy over the following scripts from **nemesis/idl/Nemesis\_idl** or **nemesis/jh852/projects/jupiter\_test/scripts**

**preNemesis.pro**

**postNemesis.pro**

**plot\_jwstmiri.pro**

The following files are also required to run preNemesis.pro

**nh3\_lambda\_10pm5um.xsc**

**jupiter\_v2015.ref**

**jupiter\_v2015.prf**

**cirscloud.aer**

**nh3\_10pm5um.xsc**

**jwst\_mrs.spx**

**jwst\_mrs.eps**

Or varients depending on which planet the simulation is being run on

To scale a column by a constant in the .prf and .ref file

**mv [name].prf [name]\_old.prf**

**mv [name].ref [name]\_old.prf**

**Profile**

**yes**

**[name]\_old.prf**

**M**

**[number]**

**[constant]**

**E**

**H**

**[name].prf**

**cp [name].prf [name].ref**

**nano [name].ref**

Then add a ‘1’ in the top row of the .ref file

To generate aerosol.prf file using Dust\_profile

**Dust\_profile**

**[name of above .prf file].prf**

**aerosol.prf**

**[Number of particle types]**

**[Number of desired model]**

**[P base] [P top] [Fractional scale height (0.1-0.5 usually)]**

**[OD] [Base pressure for that OD (1 bar usually)]**

**[Cloud cross section]**

Then check aerosol.prf to ensure changes have been correctly saved

Change observation geometry in .spx file

**nano jwst\_mrs.spx**

Edit line 4, order is;

FLAT FLON SOL\_ANG EMISS\_ANG AZI\_ANG WGEOM

Refer to page 28 of radtran manual for more information

Open **preNemesis.pro**

**nano preNemesis.pro**

line 30: change ‘planet’ to 5-8 depending on which planet is being simulated

line 34: change ‘ref\_file’ to be correct for the simulation

line 35: change .xsc file

line 36: change .aer file (can be .prf as well)

line 39: change ‘var’ to represent the variable you want to change

line 42: change directory path to correct name

line 78: change ‘ciafile’ to be the name of the cia file being used in the simulation

line 194: change path to k-tables

Run simulation for the 12 dispersers

**idl**

**.r preNemesis.pro**

Note the following warning as an output is normal

Preparing spectrum: 1 12

cp: omitting directory ‘../’

Making tempapr.dat

ISPACE: 1

znem\_cutspx: 9241.00

2 1

WAVE DOUBLE = Array[1, 9241]

SPEC FLOAT = Array[1, 9241]

ANGLES FLOAT = Array[6]

Nemesis Run Prepped, Upload to HPC

% Program caused arithmetic error: Floating underflow

Outputs from preNemesis.pro

**submitjobs**

(directories) **core [1-12]**

Expect the following files in each **core\_[number]** directory (18 files)

**aerosol.ref\***

**logfile**

**nemesis.cia**

**nemesis.kls**

**nemesis.ref\***

**nemesis.xsc\***

**fcloud.ref**

**nemesis.abo**

**nemesis.fla**

**nemesis.nam**

**nemesis.set**

**parah2.ref**

**fmerror.dat**

**nemesis.apr**

**nemesis.inp**

**nemesis.prf\***

**nemesis.spx**

**tempapr.dat**

Run Nemesis simulation on the cores

**qsub submitjob**

Check on progress of job using

**qstat**

Expect the following files in each **core\_[] directory** after a successful run of Nemesis (30 files)

**aerosol.prf**

**kk.out**

**nemesis.cia**

**nemesis.itr**

**nemesis.prf\***

**nemesis.spx**

**aerosol.ref\***

**log\_[number]**

**nemesis.cov**

**nemesis.kls**

**nemesis.raw**

**nemesis.xsc\***

**fcloud.ref**

**logfile**

**nemesis.drv**

**nemesis.mre**

**nemesis.ref\***

**parah2.prf**

**fmerror.dat**

**nemesis.abo**

**nemesis.fla**

**nemesis.nam**

**nemesis.sca**

**parah2.ref**

**kk.dat**

**nemesis.apr**

**nemesis.inp**

**nemesis.pat**

**nemesis.set**

**tempapr.dat**

Run postNemesis.pro to organise important outputs

**idl**

**.r postNemesis.pro**

Creates the following directories

**epsfiles**

**fh2files**

**logfiles**

**mrefiles**

**prffiles**

**rawfiles**

Remove output progress files from running Nemesis (not needed)

**rm -fv Nemesis.\***

Extract the output

**idl**

**.r plot\_jwstmiri.pro**

Copy output to home computer

**scp jh852@alice2.le.ac.uk:/[path to data]**

Generate plots of .dat files from there

To generate a cube need the script

**MIRIsim2fits\_uJy.pro**

Open the script and change the following lines

**nano MIRIsim2fits\_uJy.pro**

lines 84-87: change path to correct location (usually: /data/nemesis/lnf2/MIRI/imaging/[filename])