Aerosols section of the HITRAN compilation

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This section of HITRAN has been constructed by:
Dr. Steven Massie
NCAR (National Center for Atmospheric Research)
P.O. Box 3000
1850 Table Mesa Dr.
Boulder CO 80307 USA

massie@ucar.edu
+1-303-497-1404

The HITRAN-Refractive-Indices (HITRAN-RI) IDL program

This program reads in the HITRAN indices of refraction and calculates Mie spectra based upon the user's specification of a specific refractive index set and specific size distribution.

The following subdirectories and files are in this Aerosols Folder of the HITRAN compilation:

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archive/  idl_calc/       netcdf/
ascii/    fortran/     papers/
 Aerosols-Readme.pdf   commentary.pdf
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archive an archive of older refractive indices
ascii ascii files of the refractive indices
commentary.pdf Advice on light scattering and size distributions
fortran fortran 90 code (reads in the indices, does Mie calculation, and sends calculations to output ascii files)
idl_calc IDL code (reads in the indices, does Mie calculations, and sends calculations to output ascii and ps graphics files)
examples has examples of input and output files, under idl_calc subdirectory
papers has pdfs of original reference papers
netcdf netCDF files of the indices are stored here

You may want to use the unix command chmod 644 *.pro to get rid of the *'s after the download is done, and chmod 755 netcdf etc for the archive, ascii, commentary, fortran, etc subdirectories

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Using the idl_calc subdirectory as an example:

There are four .dat ascii files
directory.dat
indices.dat
work.dat
compare_spectra.dat

In the directory.dat ascii file:
Specify the subdirectory which has the netCDF input refractive indices files
Specify the subdirectory to which output text and ps files are written to
The subdirectories are one level down from the directory that contains the .pro's and the .dat files.

The indices.dat ascii file lists the indices files (leave as is)
The listing is coordinated with the rdindices.pro routine

The compare_spectra.dat ascii file in the compare_spectra subdirectory specifies which spectra files to intercompare (the user places ascii files of calculations and/or observed extinction spectra in this subdirectory)

The work.dat ascii file specifies the work to be done.
EDIT this file to specify the specific work to be done.
Generally, integer flags are set to 1 to do something, 0 to not do.
See the examples subdirectory for several examples of the work.dat file

itest Specify itest=1 in work.dat if a test case is calculated.

icompare Specify icompare=1 if you compare (graph) two sets of indices.

iset For the main calculation, specify which index set is used
The iset value corresponds to one of the sets listed in the indices.dat ascii file. The indices.dat file and rdindices.pro routine will change as more indices are incorporated into the IDL program.

igraphi If=1 will graph the indices of refraction (original set and those interpolated to the specified output scale).

iwave If=1 will use an output wavenumber scale.
If=2 will use an output wavelength scale.
w1,w2,dw The range of wavenumber (or wavelength) and point spacing.

The size distribution is a log-normal size distribution with 2 modes
den1,rad1,sig1 total number (#/cm3), mean radius (microns), width
den2,rad2,sig2 total number (#/cm3), mean radius (microns), width
Note that alog(sig1) and alog(sig2) are used in the log-normal distributions.
igraphd If=1 will graph the size distribution used in the calculation.

igraphe To graph the extinction, scattering, absorption, asymmetry, and single scattering albedo spectra put igraphe=1

Other print flags allow one to write out the details from the various parts of the code, and write out ascii and netCDF files of the output from the code.

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To run the idl program
idl
>.r main

The program will ask you some information (the specifics depend upon on which refractive index set you work with). The program prints out to the screen (e.g. tells you the path names of various ps graphics, ascii and netCDF data files that are created by the program)

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Please send comments on program bugs, and suggestions on ways to improve and enhance the program, to the point-of-contact, Dr. Steve Massie.
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