MieTab Index

Commands

Procedures

The **Index** contains a list of topics for which on-line help is available.

The **File** menu contains commands which may be used to save the data in the current worksheet as an ASCII file, or to exit(close).

For more information, select the File menu command name.
Save
Save as
Exit

File **Save** or **Save as** commands:

These commands may be used to save numerical data in the current worksheet in the form of a plain text (ascii) file.

Choosing then opens a dialog which request the file name,etc.

NOTE: Saving data in a file erases the data from memory so that it cannot be saved again by means of the same commands. The data remain in the worksheet, however, and may still be copied to the clipboard if desired (and, hence, saved in an editor's file if you like). Although those data are visible in the worksheet, only newer data created by subsequent Runs will be processed by repetitions of the Save command.

File **Exit** command:

This command will terminate execution of MieTab. If you have not saved results from recent runs you will be asked whether or not you wish to save them before termination actually occurs. Its action is the same as the Close command.

The **Mode** menu:

The Mode menu is used to indicate whether size data will be entered in terms of radius or in terms of Mie size-parameters, and whether more than one size is to be treated within a run.

The **Options** menu:

There are three items on this menu:

1) **NUMBER OF ANGLES FOR PHASE FUNCTION:** an integer between 0 and 181. The larger the number, the slower execution will be.

2) **LONG FORM FOR PFN DATA**: "Check" this box to get just one (angle,phase function) data pair per line in a saved data file. The default is four such pairs per line.

3) **COMPUTE CROSS SECTIONS**: "Check" this box to calculate absolute cross sections rather than efficiency factors. The sate of the check box has no effect for modes in which sizes are based only on Mie size-parameters.

The **Graph** Menu:

Used to select type of graph to be sketched.

1) **Q's or C's**: Calls a popup menu from which you select one of the four types of efficiency factor (Q) or cross-section (C) vs size graphs. Which you get (Q or C) depends on the mode and how the "cross section" box setting found on the Options dialog. The selected graph will be drawn immediately after clicking (or a keyboard "Enter").

2) **PHASE FUNCTION**: Creates an immediate graph of the phase function associated with the most recently treated particle size. (Also see Options)

Reset

This command clears most data from the work sheet, and erases the buffer used to hold data which might have been saved in a file or used for graphs. Most user entered options are retained however.

Run

This command causes calculations associated with the currently chosen mode and options to begin. Numerical results will be displayed in the work sheet window as they are obtained.

Saving data in a text file:

Click on the File and then the Save command, and enter a file name (including path if desired) in the ensuing dialog.

An **efficiency factor** is the ratio of the cross section for a process to the area of a great circle of a spherical scatterer.

Four kinds of processes are treated in MieTab:

SCATTERING: power loss from an incident beam due to scattering away from the direction of propagation.

ABSORPTION: power actually absorbed (and not re-emitted).

EXTINCTION: sum of power losses due to both absortption and scattering.

BACKSCATTER: power scattered directly back toward source; see Van de Hulst, p. 284 for detailed definition.

The Mie "**size-parameter**" is the ratio of the circumference of a sphere to the wavelength. It is usually represented by the letter x or a Greek "alpha". Here we use x.

Printing a Graph:

Graphs must be printed while displayed on screen.

1) Select the Print command from the menu bar
2) Click on the Begin print option.

You can adjust the size of the printed graph by means of the Scaling factors option , and its position on the printed page via the Set Offsets option,

Saving worksheet results in a file:

To save current worksheet results in a plain text (ascii) file:

1) Select the File Save or File Save as options from MieTab's main menu bar.

2) Enter a name for the file in which data are to be saved in the popup dialog.

NOTE: If the number of phase function angles is non-zero, phase function values will also be written to the file even though they are not displayed in the worksheet. The format of the phase function data depends on the state of the "Long form" checkbox in the Option dialog.

GLOSSARY

Print scaling factors:

It is possible to make some adjustments of the size of a printed graph by assigning values to the print scaling factors by means of the Scale Factor item which appears on the popup menu shown when you click on the Print command of the MieTab Graph menu bar.

After displaying a graph:
1) Choose the **Print** command,and
2) Then choose the **Scale factors** command.
3) Enter factors by which the X (horizontal) and y (vertical) coordinates will be multiplied before data is sent to the default Windows printer.

The complete "window" upon which graphs are displayed is 400 "pixels" on a side. The size of the printed graph depends on the number of dots per inch (dpi) of the printer. If your printer has a vertical resolution of 100 dpi and a horizontal resolution of 200 dpi and both scale factors are 1.0, then the printed image will be (400/100) inches tall and (400/200) inches wide. Note however that some of the space used on the screen display (like the title and menu bar) will not be sent to the printer.

Printer Offsets:

The printing origin is at the upper left of a sheet of paper. Printed graphs may be moved to the right by setting a horizontal offset value in pixels, or down the page by entering a vertical offset value.

The actual offset **distance** will depend on the resolution of your printer. For example, if your printer has a resolution of 75 dpi (dots per inch) vertically and of 120 dpi horizontally, then a y-offset of 150 will move the graph (150/75) inches down the page, and an x-offset of 150 will move it (150/200) to the right.

After displaying a graph:
1) Choose the **Print** command,and
2) Then pick the **Set Offsets** command.
3) Enter the desired offsets via the ensuing dialog box.

The **phase function** described the intensity of scattered radiation as a function of the scattering angle when the incident radiation is unpolarized. The numerical values produced by MieTab are normalized so that the integral over solid angle is 1.0.

External integration of MieTab's printed phase function values over solid angle may not yield 1.0 if only a small number of angles were used. For large size-parameters, even the maximum of 181 angles permitted in MieTab may be inadequate.

The **scattering angle** is the angle between the propagation direction of the incident plane wave and the direction of a scattered wave.