



Spect3D

user's guide

Revisions for SPECT3D v. 22.0.0

SPECT3D:

- For Mac computers: all codes are built on Apple M-series silicon chips. Computers with Intel processors are no longer supported.
- The option to write *SPECT3D* workspaces with the older non-JSON format has been removed. Previously created non-JSON workspaces can still be read in.
- In *Preferences*, the option to include MERL lineshapes databases has been added. If this box is checked, transition linewidths will be overridden by those that exist in the MERL database, provided that database is installed in the atomic data directory being used. To request ATBASE- or FAC-specific MERL databases, please contact Prism. More information can be found in appendix titled "Stark Broadening".
- Several improvements in modeling dense plasma effects on atomic kinetics, line shifts, and photoionization edges. More information can be found in appendix titled "IPD and polarization shift".
- 2D plot windows now support mouse wheel zooming centered on the cursor position.
- Support for augmenting the spectral grid used in calculations with additional photon energy points has been added. On the *Spectral Grid*, points are entered using a table. This option is designed to allow users to obtain enhanced resolution around spectral features of interest.
- Specifying *Data Directories* in *Preferences* has been updated. Using environment variables on Windows to obtain default locations for atomic data, and equation of state, and opacity libraries has been removed. Users set the location of the data libraries by browsing for the relevant directory. A history of the data directories utilized is now stored, so that users can more easily change data directories (e.g., changing between FAC and ATBASE atomic data).
- The *Data Directories* in *Preferences* are now written to the workspace file. When reading in a workspace file, if the data directory names in the workspace file are different from those in *Preferences*, a message is displayed, notifying the user that if a calculation was previously run using this workspace, running a new may lead to different results due to using the different databases.
- The option to show space-dependent data (e.g., temperature, density) using scatterplots has been added to the *Detector-Target Viewer* and windows showing hydro data.
 - When there are a large number of points ($> 50K$) volume elements are in the grid, the number of scatterplot points is reduced by randomly selecting volume elements to be shown.
- Bug fixes:
 - Fixed element string error that could occur in DCA Atomic Elements list when D, T, or He3 isotopes are utilized.
 - A warning now appears if the number of times in an exodus file exceeds 10,000, instead of crashing.
 - Fixed bug reading exo files generated by *PlasmaGEN* that contain hot electrons.
 - Fixed occasional crashes (stack overflow) for DCA calculations with very large number of zones.
 - For some time-dependent calculations with more than one detector, the spectra and images on all detectors other than the first one could erroneously be zeroed out.

SpectraPLOT:

- The option to write *SpectraPLOT* workspaces with the older non-JSON format has been removed. Previously created non-JSON workspaces can still be read in.
- The option to show space-dependent data (e.g., temperature, density) using scatterplots has been added to windows showing hydro data and ionization-related data.
- 2D plot windows now support mouse wheel zooming centered on the cursor position.
- When viewing plot results, the number of significant figures shown when using the *Show Data* or *Show Coordinates* tools can be adjusted by right-clicking in the data box.
- In SpectraPLOT line plot data can be edited to transform plots. Once a plot's data has been edited, an "[edited]" tag will be appended to the plot's legend entry. Edited plots can be reverted using the "Undo Edits" button which appears after an edit has been applied. Undoing said edit will remove the "[edited]" tag from the legend.
- Bug fixes:
 - Streaked Spectra: Times are now sorted so that plot is not affected by the order in which times are selected.

Plasma Grid Generator:

- The option to write PlasmaGEN workspaces with the older non-JSON format has been removed. Previously created non-JSON workspaces can still be read in.
- 2D plot windows now support mouse wheel zooming centered on the cursor position.