



3D Data Analysis & Visualization Toolkit

Supporting the FASTER-physics System Testbed & Research (FASTER)

Multi-scale Visualization and Evaluation System



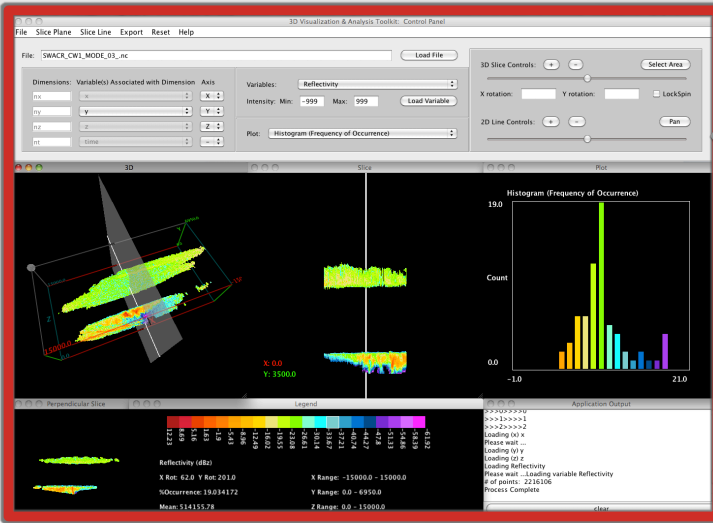
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The 3D Data Analysis & Visualization Toolkit is being developed to fulfill the need for easy-to-use, platform-independent, web-deployed, dynamic interactivity with large volumes of 3D observational and model data at a range of scales, complemented by co-located ARM 2D and in-situ data.

Summary: The development of the 3D Data Analysis & Visualization Toolkit will make 3D data visualization and co-located data stream analysis easily accessible to the FASTER, ASR and ARM communities.

3D Data Analysis & Visualization Toolkit: Layout



Layout

Functions & Features

Functions & Features

Control Panel

- Single-click load of 3D or 4D gridded netCDF file data
- Select data file dimensions & variables for display
- Export slices & statistics to netCDF file format
- Export images
- Limit intensity range
- Define rotation in 3D Volume panel
- Control display features
- Select pre-defined plots for display

3D Volume

- Automatically displays rendering of 3D gridded data
- Rotate and zoom in on 3D volume
- Interactively slice 3D volume in X/Y/Z or arbitrary plane to generate slice in the next panel

Slice

- As the user slices the 3D volume, a 2D data slice is rendered in this panel
- The user may also interact with the 2D data slice to plot intensities along a line
- Plot statistics in the next panel are automatically updated

Plot

- Plots are generated as the user dynamically changes the volume display or moves the slice
- Plot properties:
 - Frequency of occurrence
 - Intensity series along line
 - Min/max intensity as a function of X/Y/Z
 - Top height within a slice/volume
 - Number of layers within a slice/volume

- #### Perpendicular Slice
- Displays slice perpendicular to slice in the Slice panel

Legend & Statistics

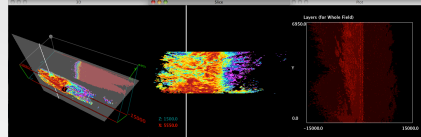
- This dual-purpose panel displays the modifiable legend corresponding to the 3D Volume, Slice, Plot and Perpendicular Slice panels
- Includes X/Y/Z ranges

Output Console

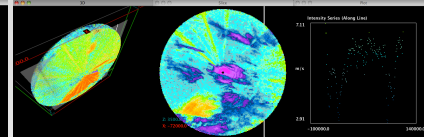
- Provides additional file information, data statistics, and process status messages

Examples

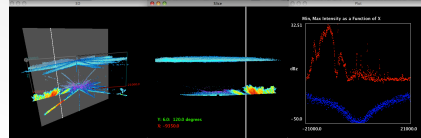
Scanning W-Band ARM Cloud Radar (SWACR)



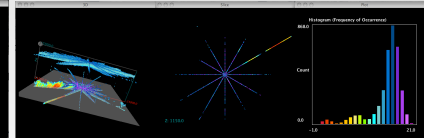
Mapped Moments to a Cartesian Grid (MMCG) VAP from Scanning ARM Precipitation Radars



Scanning ARM Cloud Radar (SACR)



Scanning ARM Cloud Radar (SACR)



DEMONSTRATION

Future Development Plans

- Integration of non-radar datastreams such as lidar and soundings to facilitate analysis and interpretation of data
- Browse remote files and download
- Multiple 3D data file load and display
- Integration with the FASTER web-based testbed

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