

## **MISR\_View and MISR\_Plot: Software Tools for Accessing and Visualizing MISR's Multispectral, Multiangle Data**

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Misr\_view and misr\_plot are IDL-based, cross-platform display and analysis software tools specifically for use with Multiangle Imaging SpectroRadiometer (MISR) HDF-EOS "grid" data files. Although there is some overlap in the methods the two applications utilize to display MISR parameters, these tools serve distinctly different purposes.

Misr\_view is a general-purpose viewing tool for all MISR "grid" data, including MISR L1B2 georectified radiance, MISR L1B2 radiometric cloud masks, all MISR Level 2 geophysical products, the MISR Ancillary Geographic Product, and AirMISR L1B2 georectified radiances. Through the use of a data selection graphical user interface (GUI), a user has the ability to extract any parameters for a contiguous range of blocks, assemble the blocks for display, and overlay parameters having different spatial and bit-depth resolutions into the RGB and ancillary planes of a sophisticated viewing window. The viewing window has several utilities and tools including: data transforms (to perform tasks such as data scaling and unpacking), map projections, vector overlays, linking of multiple viewing windows via geolocation, histogram viewing and stretch manipulation, tools for constructing anaglyphs, automatic scrolling through a large range of blocks at full resolution, loading of 8-bit color tables and emulation of 24-bit RGB color on 8-bit display hardware.

Misr\_plot focuses on visualizing the MISR L1B2 georectified radiance product, in particular the 36 radiance measurements per pixel produced by MISR's 9 multispectral cameras, each measuring radiance in 4 spectral bands (red, green, blue, and near infrared). In addition to displaying the radiance data within a viewing window as described earlier, misr\_plot utilizes an additional interface which allows an analyst to view all of the radiance information available at a given pixel, together with a reconstruction of the illumination and viewing geometry that produced this radiance. The radiance data are plotted as a function of viewing angle in a collection of four panels, with each panel representing a MISR spectral band. In addition to these Cartesian plots, the radiance data are also portrayed in four semi-Polar plots, with the origin of a plot representing the intersection of the 9 MISR viewing directions at the pixel in question. Using the ancillary data archived with the MISR imagery, misr\_plot calculates and displays the solar illumination vector, vector normal to the reflecting surface, angle of incidence, angle of emergence, and phase angle on the polar plots. These plots are rendered as three-dimensional graphics that can be scaled and rotated interactively, allowing an analyst to decide upon the best visualization of the illumination and viewing geometry at a given pixel.