

Visualization Standards

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Outline

- " Visualization Standards?
- " An incomplete list and biased assessment of visualization options
 - IDL, AVS, OpenDX
 - <http://sal.kachinatech.com/D/1/index.shtml>
- " OpenDX Example
- " Conclusions

Visualization Standards

- " Need to have the ability to display 3D data in variety formats
 - Scalars - Isosurfaces, contour plots, volume rendering
 - Vectors - Field lines (streamlines), streaklines, hedgehogs (glyphs)
- " Visualization standards not software packages
 - Everybody's got their favorite and you'll never please everyone
- " Desirable features of package
 - Supports distributed (web) and local visualization on numerous platforms
 - Inexpensive or already in wide usage

IDL

- " Widely used data visualization package
- " Excellent for 1D and 2D data plots
- " Not so good for 3D data
 - Cannot directly render 3D data on irregular grids
 - Manipulating 3D view is difficult
- " Can be linked to web based visualization via perl scripts and cgi bin web pages
- " Licenses are not cheap

AVS

- " Not widely used data visualization package
- " Excellent for rendering 2D & 3D data
 - Easily visualizes data from irregular grids
 - User interface to view manipulation is trivial
- " 1D data plots are possible, but cumbersome
- " Very expensive
- " Direct web visualization not easily implemented

OpenDX

- " Open Source Data visualization package based upon IBM's commercial Data Explorer visualization system
 - Has a very active development community
 - Open Source => Free :-)
- " Excellent for rendering 2D & 3D data
 - Easily visualizes data from irregular grids
 - User interface to view manipulation is straight forward, but not as trivial as AVS
 - Can visualize results from Composite Grid systems
- " Translation of visual programs into web page is accomplished through implementation of DX in Java

OpenDX Example

- " Visual program (net) setup to render parameters on contours in the magnetosphere and trace streamline through vector fields for simple IMF conditions (north,south,west)
- " Network has been placed online as JavaDX web page for remote access
 - kansas.dartmouth.edu/java/user/BasicLFMWeb.html

Conclusions

- " Recommend development of OpenDX based visualization system
 - No cost for users to install program on platforms ranging from almost UNIXes and Windows
 - " Allows users to conduct more advanced investigations with local data and local rendering
 - Web pages can allow sophisticated view manipulation and data investigation
 - Goto www.opendx.org for more information