

# Remote Visualization of Complex Phenomena on Very Large Datasets

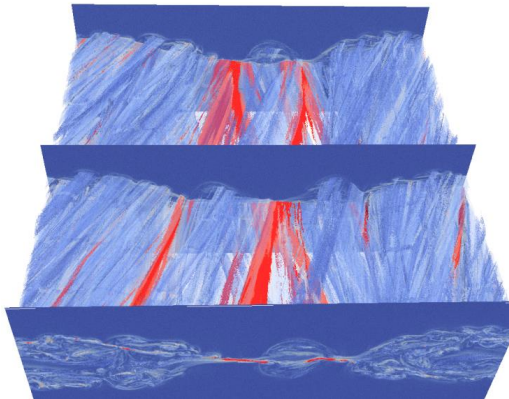
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## Objectives

- To understand the 3D evolution of tearing modes (causing plasma instabilities) in simulations of magnetic reconnection
- Challenges
  - Large data size generated by high resolution simulation on 98304 cores
  - 6.4 billion cells, 1.5 trillion particles, 57 TB data
  - Only remote access to the supercomputer
  - Lack of dedicated visualization resources

## Impact

- Interactive 3D visualization of simulation data
  - Particle data and Mesh data
- Comparison with theoretical expectations
- Rapid exploration due to limited availability of supercomputer to run large simulations
- Scaling ParaView: general purpose data analysis and visualization tool focused on large data



Two isosurfaces showing the structure of particle density (blue) and current density (red).

## Accomplishments

- Allowed scientists to remotely analyze and visualize their data when it is not possible to copy locally
- Allowed scientists “to rapidly explore the grid data to understand the 3D evolution of magnetic reconnection”
- As expected, a spectrum of tearing instabilities develops which interact, forming new current sheets and triggering secondary tearing instabilities



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Scalable Data Management, Analysis, and Visualization