

DEVELOPMENT OF TENSOR VISUALIZATION SOFTWARE

VERTICAL:
AEROSPACE & DEFENCE

SERVICE:
ENGG. SOFTWARE DEVELOPMENT

TECHNOLOGY:
CFD

This work was done for a defense lab involved in the development of computing solutions for numerical analysis and their applications, which include scientific visualization packages. The client required modules for visualizing tensor data. Tensors fields are generated in a broad range of areas like medical imaging, material sciences, electromagnetic etc. and hence require different visualization techniques based on the application area. Tensor data also tends to be large owing to 9 component values per cell for a second order tensor.

With experience in writing the in-house scientific visualization package, ViewZ™, Zeus Numerix was able to provide modules for visualizing second order tensors. These included hyper-streamlines, tensor ellipsoids and surface deformation. The modules were written in C++ and integrated with the existing codebase with the client. Python bindings were also provided for the same.

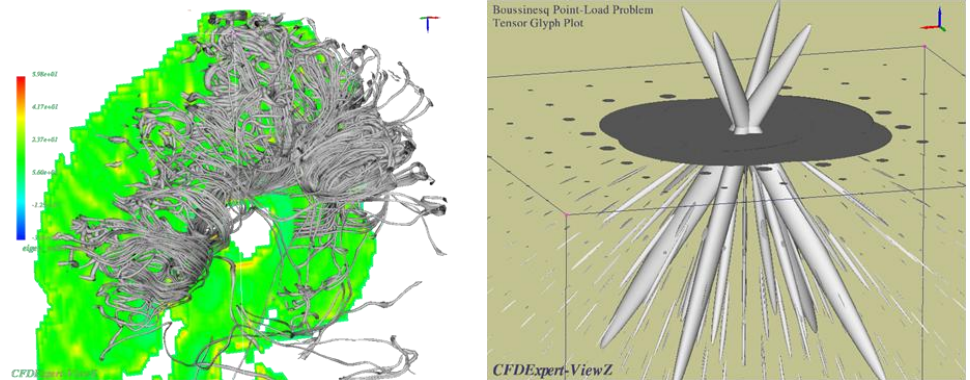


Figure 22: Tensor visualization (a) Brain (b) Boussinesq problem

With the tensor modules integrated into client's visualization system, one of the most complex parts was taken care.