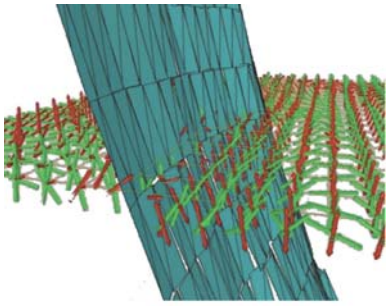
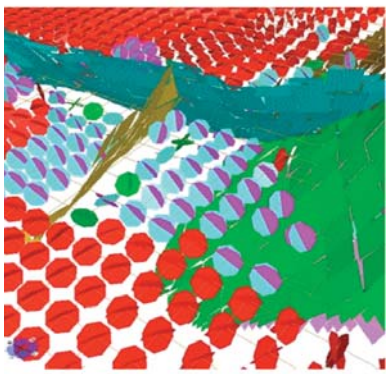
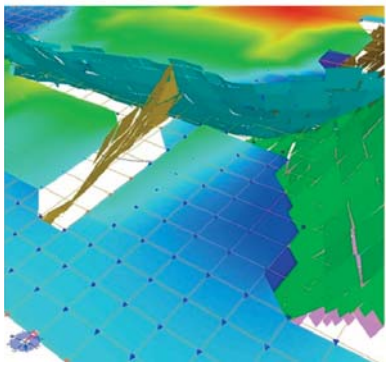
faulted

GEOMECHANICAL FRACTURE PREDICTION







Traditionally, fracture prediction in the sub-surface has been based on extrapolation of fault-size population data, interpolation from direct observations and/or geophysical methods. Our approach in TT6 is somewhat different and ultimately more physical. Geomechanical models offer a fresh, independent approach to fracture prediction that can be calibrated with direct observations and can be used to condition discrete fracture networks. In TT6's FaultED it is possible to estimate the relative density of unobserved faults/fractures, their orientations and mode of failure directly from the structural model. Using elastic dislocation theory we compute subsurface displacements and strains from the fault slip geometries and a regional background strain. Then, assuming a linear elastic rheology we are able to compute stresses and compare them with a failure criterion.

The FaultED module provides a single environment and advanced, scenario-based, infrastructure for modelling strain, stress and probable failure planes associated with fault displacement.

Model predictions can be made on arbitrarily oriented grids, on grids that are coincident with horizon surfaces or on well tracks. As part of the modelling process, FaultED implements a numerical inversion procedure that restores observation surfaces and wells to their pre-faulted state. This doubles as a useful QC check for ensuring that the ED approach is a suitable tool for the geological environment under investigation.

Models can be imported from other applications or generated entirely within TT6. All FaultED output is exportable and there are tailored formats for certain 3rd party applications.