



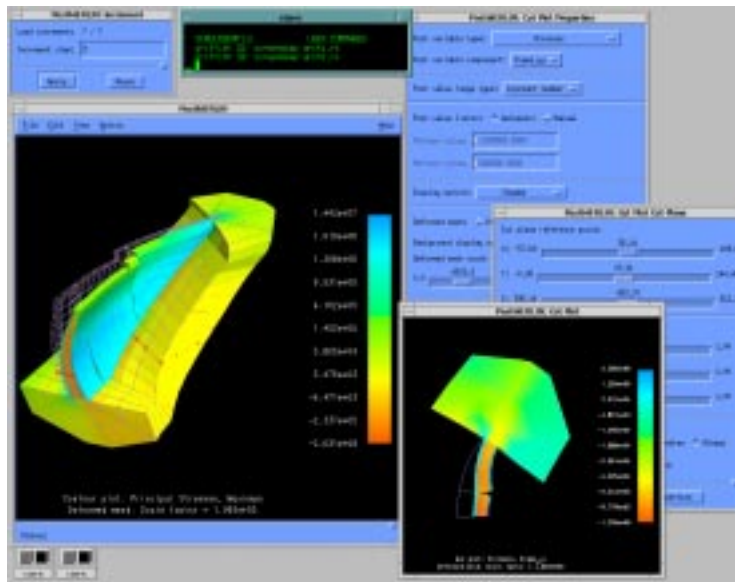
MERLIN

CEAE Dept., University of Colorado, Boulder
Campus Box 428, Boulder, CO 80309-0428
(303) 492-1622, Fax: (303) 530-7605
<http://civil.colorado.edu/~saouma/saouma.html>



An Engineering Tool for the Finite Element Safety Analysis of Structures.

MERLIN is a finite element software package developed at the University of Colorado under contract from Electric Power Research Institute. In addition to general purpose finite element capabilities, it implements modern fracture mechanics based methods to simulate discrete crack propagation in structures.



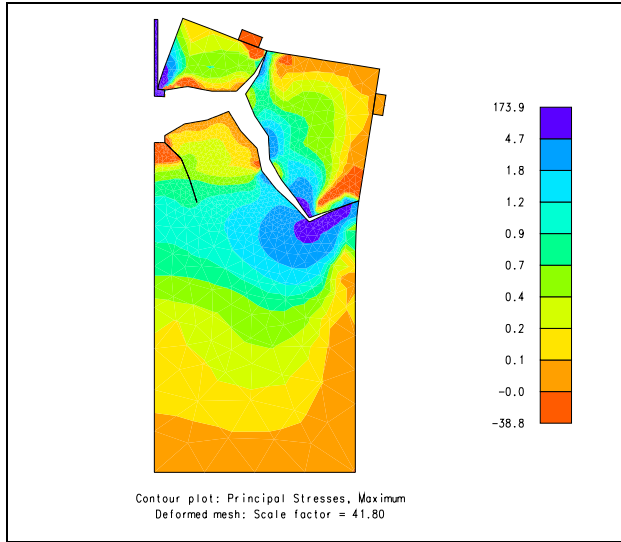
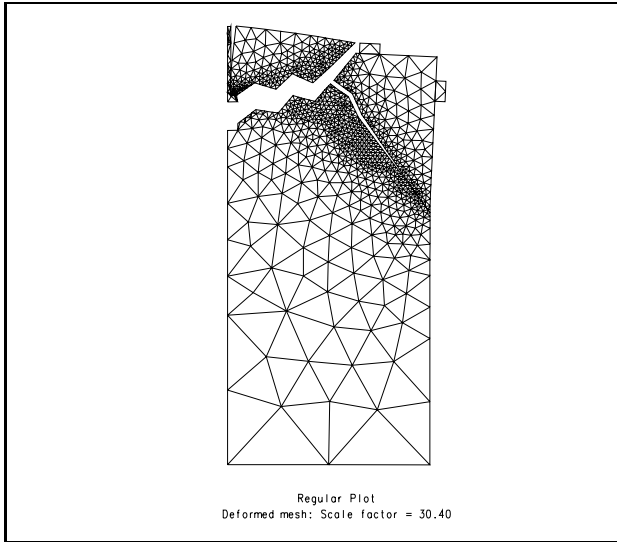
Contraction joint openings in 3D arch dam.

Capabilities

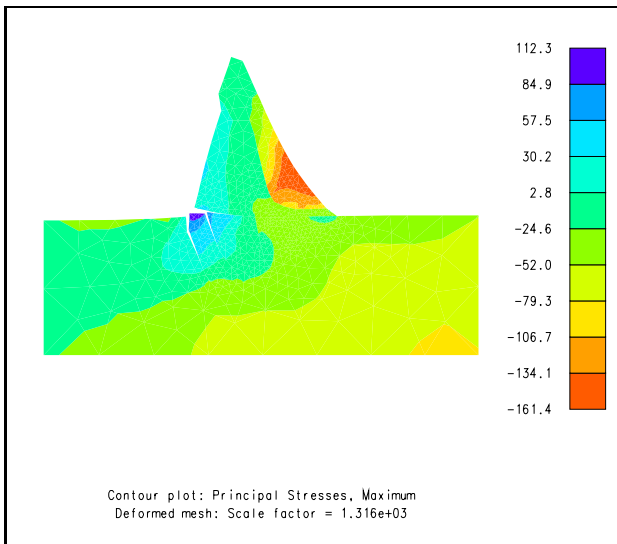
- Fully automated 2D/3D mesh generator.
- Fracture mechanics.
- Library of 43 2D/3D solid elements.
- Static and transient stress analysis.
- Uncoupled steady state and transient heat analysis.
- Uncoupled steady state seepage-flow analysis.
- Non-linear material models for concrete/rock, metals, bond and joints.
- Powerful interactive graphical post-processor (deformed mesh, shading, contour lines/surfaces, vector plots, 2D/3D arbitrary cuts, carpet plots, pick node, hardcopy, crack surface tractions).
- Extensive documentation, user's, example and tutorial manuals.

Unique Features

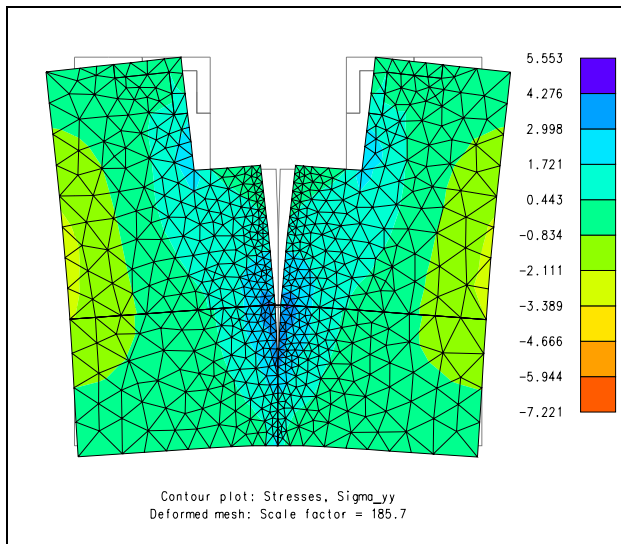
- Automated remeshing to simulate crack propagation (2D/3D).
- Numerous fracture mechanics capabilities for both linear and non-linear analysis (contour integrals, fictitious crack model, J -integrals, singular elements).
- Extensive library of non-linear solution techniques for failure load determination (Newton-Raphson, Modified Newton-Raphson, Secant-Newton, Arc-Length, Load-Scale and Indirect Displacement Control Methods).
- Non-linear solution methods applicable to non-scalable loads such as those induced by hydrostatic pressures.
- Fracture-fluid interaction models.
- User defined subroutines for constitutive model, loading, material softening and fracture-fluid interaction.



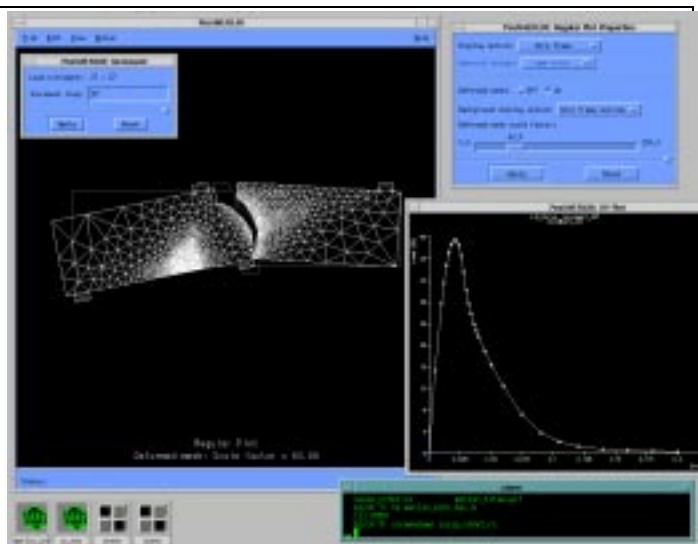
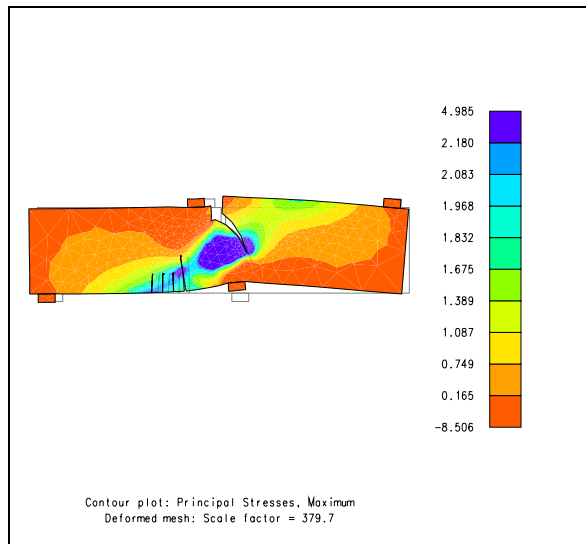
Fracture mechanics analysis of anchor bolt failure.



Fracture mechanics analysis of buttressed dam.



Wedge splitting test with reinforcement.



Shear beam failure.