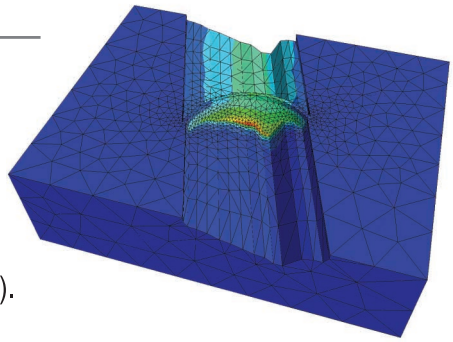
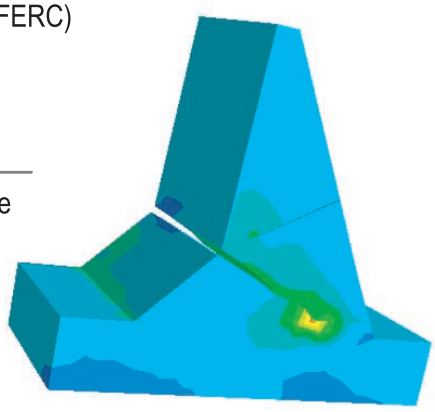
Leader in Advanced and Efficient Finite Element Analysis of Concrete Dams with MERLIN



Dynamic Analysis:

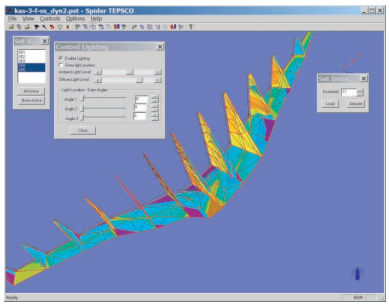
Time Integration: Implicit (Newmark β , Hughes α); Explicit (single CPU/Parallel).
Restart: from Static (with dynamic elastic properties), Reset displacements to zero.
Rayleigh Damping: Different coefficients for rock and concrete.
Foundation: Mass but no gravity.
Radiation Damping: Without/with interaction with free field (Lysmer/Miura).
Reservoir Modeling: Added mass (Westergaard, Zanger) or fluid elements.
Uplift Models: Automatic adjustment with crack propagation; Static (FERC) or dynamic uplift.
"Validated" with centrifuge dynamic tests.



Nonlinear Analysis:

Algorithms: Newton-Raphson, Secant Newton, Initial Stiffness, Line Search, Arc-Length.
Cracks/interfaces: Over 5 different types of interface elements. Smeared crack elements.
Constitutive Models: Over 20 different models.

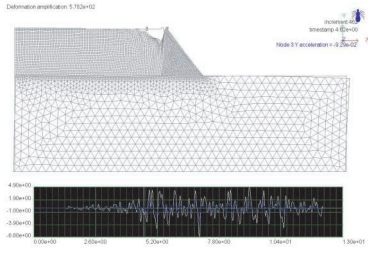
Other



AAR: Kinetics model for expansion, 3D AAR strain redistribution based on stress tensor, Tensile strength and Young's Modulus degradation.
Scalar Field Problems: Thermal (transient) and uplift linear analysis.
Staged Construction: approximated.

Supporting tools:

Beaver: Special purpose code to easily generate FE mesh for double curvature arch dams.
Kumo: Powerful 3D mesh generator (based on T3D) written for dam and fracture analysis.
Spider: Post Processor for display of incremental nonlinear analysis, eigenvectors, and transient analysis results.



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