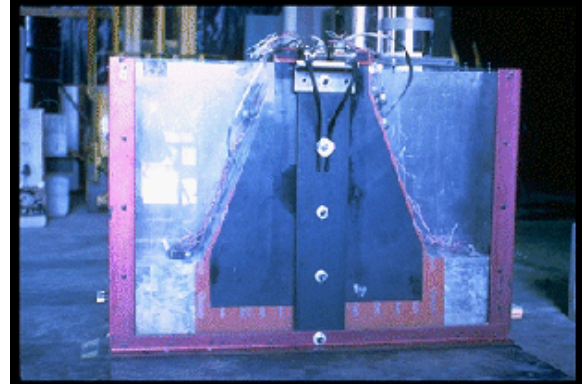


Centrifuge Testing of Gravity Dam Models

CEAE Dept., University of Colorado, Boulder
 Campus Box 428, Boulder, CO 80309-0428
 (303) 492-1622, Fax: (303) 530-7605

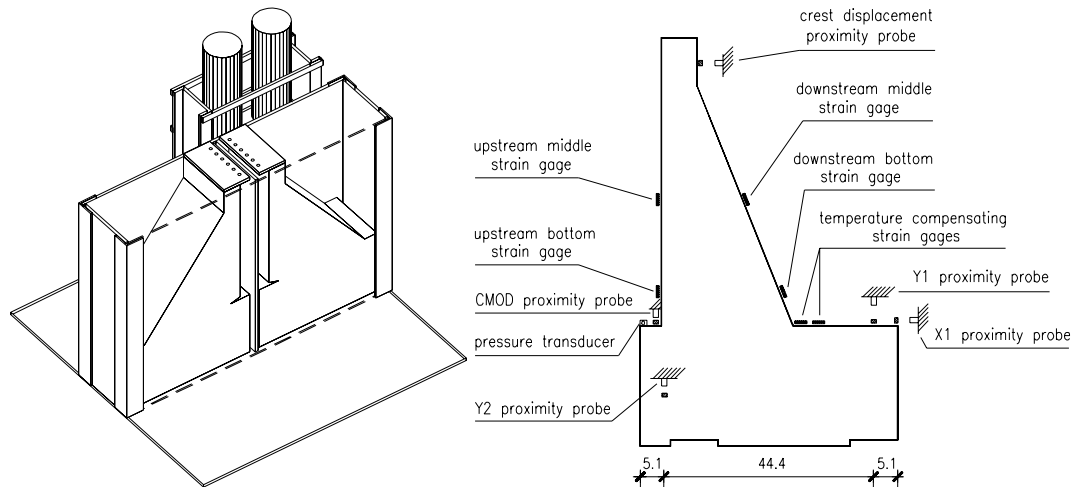
saouma@civil.colorado.edu

<http://civil.colorado.edu/~saouma>



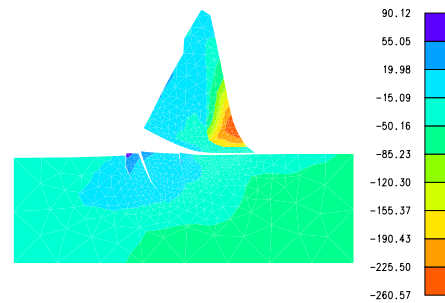
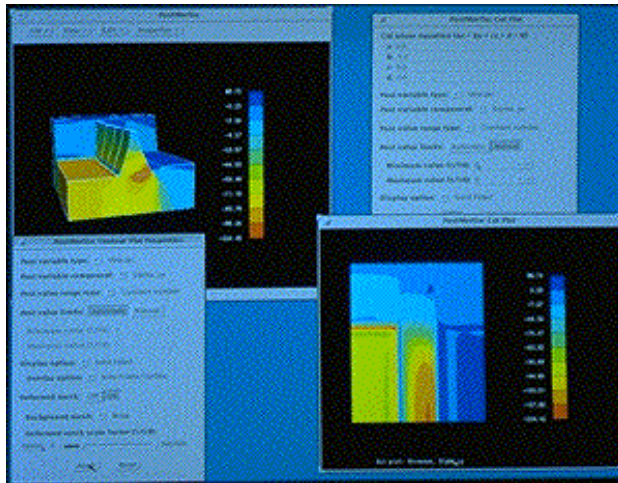
Model tests of gravity dams can only be undertaken in a centrifugal environment in order to properly respect all similitude laws. Through an EPRI project, testing procedures, and instrumentations were developed at the University of Colorado to perform model tests of concrete dams.

A model is first carefully prepared and instrumented, then placed in a specially built container, which in turn is mounted on the centrifuge rotating arm. Once the desired g level (inversely proportional to the model scale) is reached, valves are opened, and the dam impounded. Then, once the water reaches the crest, overtopping and possibly failure are simulated by opening compressed air valves.

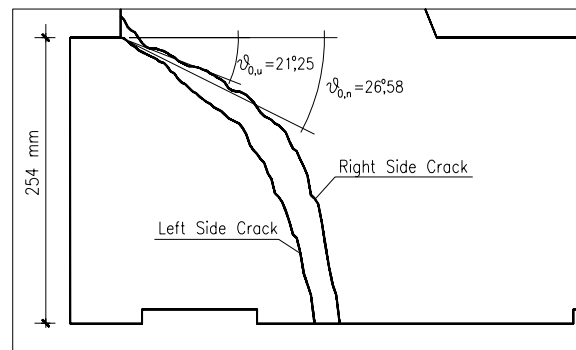
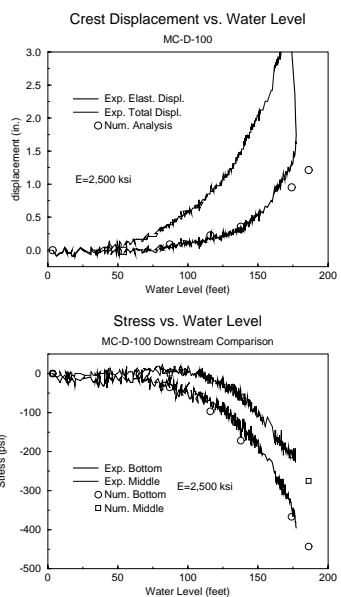


Throughout the test, strains, displacements, pressures and crack trajectories are continuously monitored and recorded for final analysis.

To complement the experimental test, sophisticated fracture mechanics based analysis are performed using the MERLIN code also developed through the auspices of the EPRI.



Contour plot: Principal Stresses, Maximum
Deformed mesh: Scale factor = 1.304e+03



At the University of Colorado, we stand ready to provide you with a unique combination of experimental and computational expertise for your dam safety investigation.

Plizzari, G., Waggoner, F. and Saouma, V., **Centrifuge Modeling and Analysis of Concrete Gravity Dams**, *ASCE Journal of Structural Engineering*, Vol. 121, No. 10, pp. 1471-1479, Oct. 1995.

Waggoner, F., Plizzari, G. and Saouma, V., **Centrifuge Tests of Concrete Gravity Dams**, *Int. J. of Dam Engineering*, Vo. IV, No. 3, pp. 145-171, 1993.

Saouma, V., **Centrifuge Modelling and Analysis of Concrete Gravity Dams**, EPRI Technical Report TR-105824, November 1995.