

# Dam break with elastic gate opening

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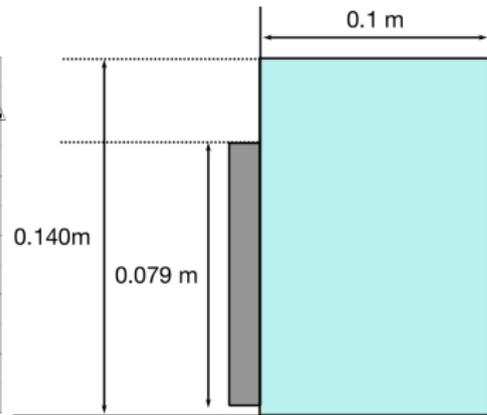
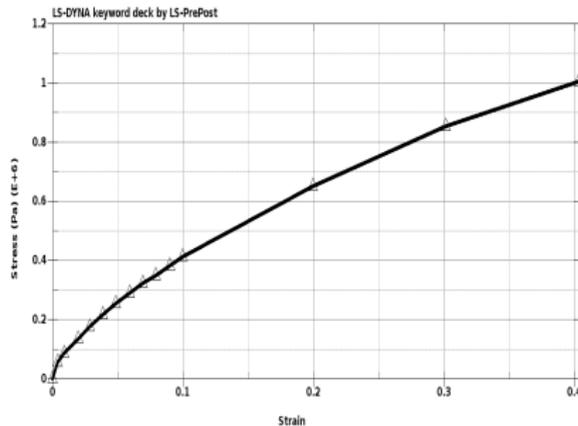
Rodrigo Paz

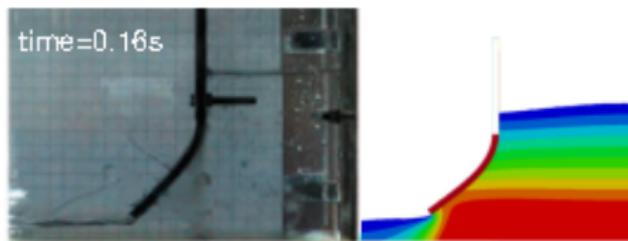
*LSDYNA ICFD solver*  
*Dev version SVN 109309*



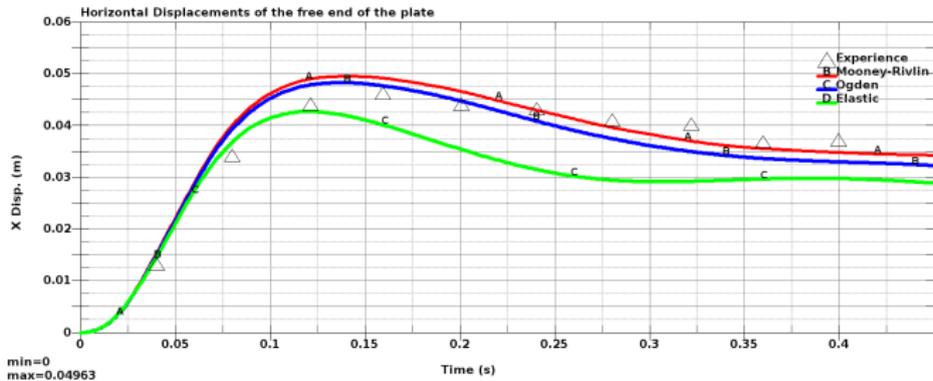
**LSTC**  
Livermore Software  
Technology Corp.

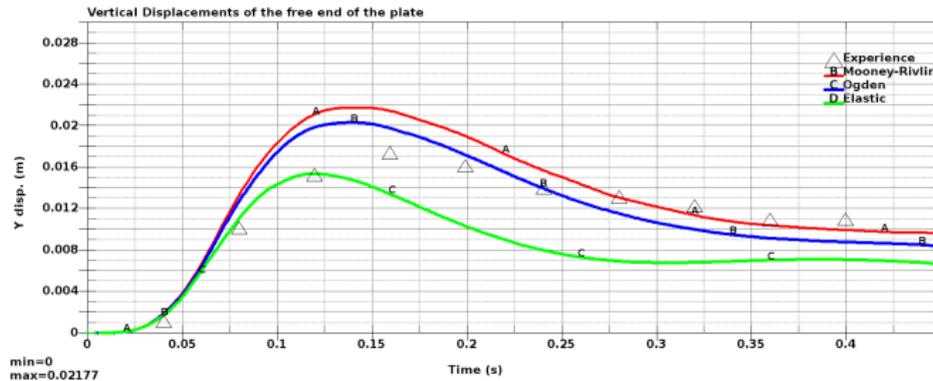
The proposed test case consists of a flexible gate, clamped at one end and free at the other which interacts with a mass of water initially confined in a free surface tank behind the gate. Due to the uncertainty of the material used, an elastic material as well as hyperelastic models (Ogden, Mooney-Rivlin) will be tested. For the elastic material, density will be equal to  $1100\text{kg}\cdot\text{m}^{-3}$ , Young's modulus to  $E = 10\text{e}6\text{Pa}$  and the Poisson coefficient to 0.4. For the hyperelastic materials, a strain-stress curve will be used as input. Freeslip boundary conditions will be used throughout the model and the timestep chosen will be  $5e - 4\text{s}$ .

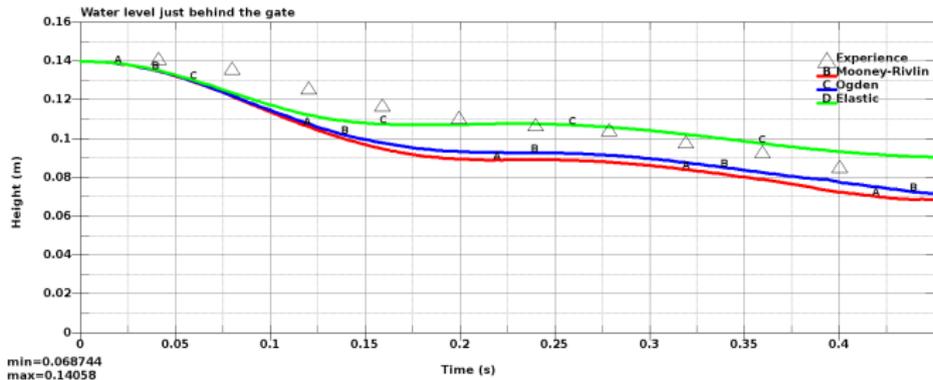


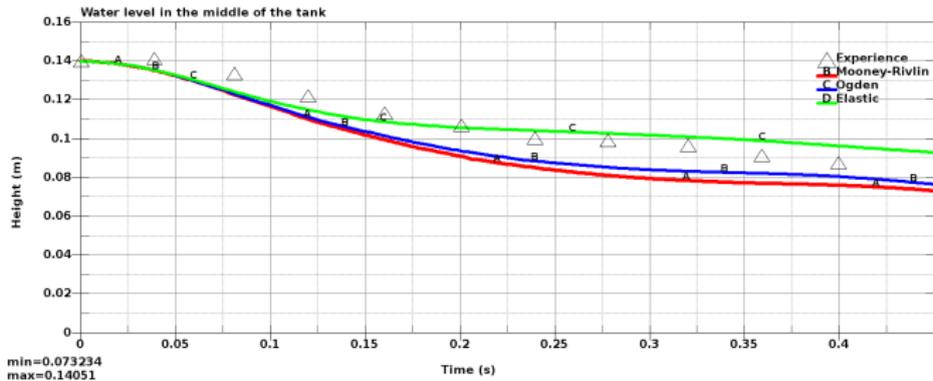












- [1] C. Antoci, M. Gallati, and S. Sibilla, "Numerical simulation of fluid-structure interaction by sph," *Computers and Structures*, vol. 85, no. 11–14, pp. 879 – 890, 2007.  
Fourth MIT Conference on Computational Fluid and Solid Mechanics.
- [2] ASME 27th International Conference on Offshore Mechanics and Arctic Engineering, *Fluid structure interaction simulation using an incompressible SPH method*, (Estoril, Portugal), OMAE2008, June 2008.
- [3] Q. Yang, *SPH Simulation of Fluid-Structure Interaction Problems with Application to Hovercraft*.  
PhD thesis, Virginia Polytechnic Institute and State University, 2011.

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