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Comparing different water equations of state for aquarium tests EDUARDO LOZANO, Colorado School of Mines, TARIQ ASLAM, Los Alamos National Laboratory, VILEM PETR, GREGORY S. JACKSON, Colorado School of Mines, LOS ALAMOS NATIONAL LABORATORY TEAM, COLORADO SCHOOL OF MINES TEAM — The aquarium test provides optical data on important aspects of the detonation performance, namely the detonation velocity, shock wave shape in the surrounding water, and expansion rate of the condensed phase explosive products. It is commonly used for calibrating reaction rate laws and products equations of state (EOS). An important aspect, with regards to the analysis, is an adequate representation of the confining material to avoid inaccuracies. We conduct a series of two-dimensional axisymmetric reactive flow simulations for an ANFO-PMMA-water system using the Ghost Fluid Method. The goal is to evaluate the results obtained using three different EOSs for water: Tait, Murnaghan, and Tillotson. The numerical calculations are compared to large-scale aquarium experiments where the HE-water interface and the water shock front locations are directly measured from time-resolved image data.

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