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SAGE CALCULATIONS OF THE TSUNAMI THREAT FROM LA PALMA

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ABSTRACT

With the LANL multiphysics hydrocode SAGE, we have performed several two-dimensional calculations and one three-dimensional calculation using the full Navier-Stokes equations, of a hypothetical landslide resembling the event posited by Ward and Day (2001), a lateral flank collapse of the Cumbre Vieja Volcano on La Palma that would produce a tsunami. The SAGE code has previously been used to model (quite successfully) the Lituya Bay landslided generated tsunami (Mader and Gittings, 2002), and has also been used to examine tsunami eneration by asteroid impacts (Gisler, Weaver, Mader and Gittings, 2003). This code uses continuous adaptive mesh refinement to focus computing resources where they are needed most, and accurate equations of state for water, air and rock. We find that while high-amplitude waves are produced that would be highly dangerous to nearby communities (in the Canary Islands, and the shores of Morocco, Spain and Portugal), the wavelengths and periods of these waves are relatively short, so that they will not propagate over long distances.