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**PROGRESS AT LOS ALAMOS NATIONAL LABORATORY (LANL) ON THE
INTER-AGENCY AGREEMENT ON PLANETARY DEFENSE**

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ABSTRACT

The Advanced Strategic Computing (ASC) project at LANL supports the inter-agency agreement between NASA and the National Nuclear Security Agency (NNSA) on planetary defense by modeling mitigation attempts against potentially hazardous object (PHOs) by kinetic impactor (KI) and nuclear explosive device (NED), and the potential consequences of PHO impacts on Earth's atmosphere and surface using high-fidelity multi-physics simulations run on massively-parallel supercomputers. We will present the results of models of mitigation attempts against a Didymos B-like target conducted in support of the DARHT mission, mitigation attempts against a highly-irregularly shaped PHO, consequences of a Tunguska-like airburst, and models of impact-related atmospheric effects.

We model the Didymos B-like target as an LL5 chondrite-like porous rubble pile with a bulk density of 2.146 g/cm^3 , and the shape model developed by the AIDA collaboration. Mitigation calculations are conducted in the Eulerian radiation hydrocode RAGE (Gittings et al. (2008)), shown in Fig. 1, and the Lagrangian radiation hydrocode FLAG (Burton et al. (1991)), shown in Fig. 2. We are exploring airburst models in RAGE and the Eulerian hydrocode CTH.

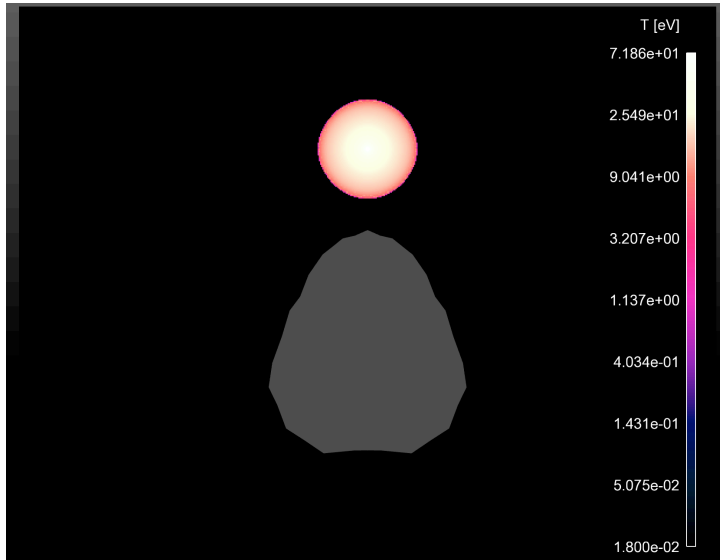


Figure 1. RAGE model of a NED mitigation attempt.

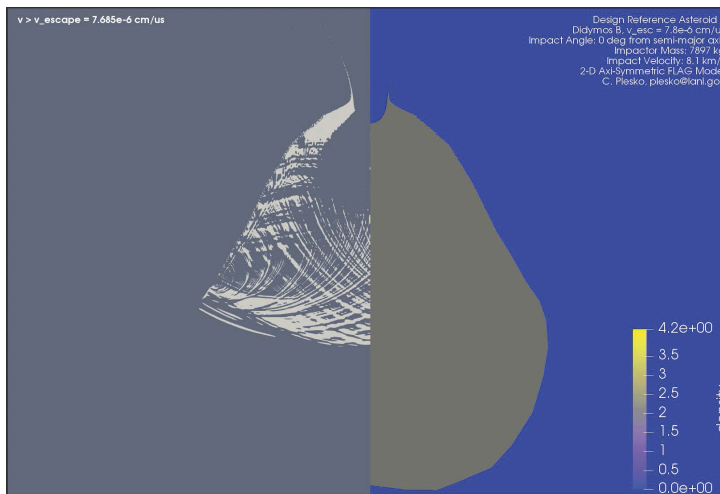


Figure 2. FLAG model of a KI mitigation attempt.
