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Hypervelocity impact on carbon nanotube reinforced a-SiC composite targets: An atomistic simulation study MAXIM MAKEEV, DEEPAK SRIVASTAVA, NASA Ames Research Center, MS 229-1, Moffett Field, CA 94035 — Atomistic simulation studies, employing the Tersoff many-body reactive potential, have been performed to investigate the hypersonic velocity impact protection properties of carbon nanotube (CNT) reinforced a-SiC composites, for a diamond spherical projectile velocities ranging from 1 km/s to 20 km/s. The scaling relations and analytical forms are derived to describe the penetration depth as a function of the velocity and radius of the projectile. A theoretical framework has been developed to describe the penetration depth behavior in the case of impact of hard projectile on hard target material. The atomistic simulation results are found to compare well with the obtained analytical forms. The effects of diamond nanoparticle impact on the a-SiC composites, with CNTs aligned parallel and perpendicular to the impact direction, caused by impact induced shock absorption and damage creation, will be described in this presentation.

Maxim Makeev
NASA Ames Research Center

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