

## Numerical Investigation on Effects of High-Velocity Impact of Micro Particles<sup>†</sup>

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The high-velocity impact process of micro particles is an important topic in many engineering fields. For example, the spacecrafts face the threats from numerous space debris. Large debris may destroy the whole spacecraft or some functional parts. Although micro particles cannot cause immediate failure of the whole spacecraft or its components, accumulative damages from impacts of micro particles should not be ignored. For example, the continuous impacts of micrometeoroids will decrease the ability of the solar array to absorb solar energy. A numerical investigation on impact effects of micro particles is presented in this paper. Influences of the impact velocity, the impact angle, the mass of micro particle, and the interactions between different particles are studied with the material point method. Theoretical predictions are examined with the numerical results and empirical formulae are proposed.

**Keywords:** High velocity impact, Material point method, Micro particles, Impact angle

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<sup>†</sup> Supported by National Natural Science Foundation of China (Grant No. 11102097) and National Basic Research Program of China (Grant No. 2010CB832701)