

Formation of cylindrical cavity in lithium fluoride irradiated by x-ray pulse

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When various solid materials are exposed to intense x-ray radiation, a cylindrical cavity can form inside the target [1]. Determination of threshold density of deposited energy is necessary for development of new laser technologies [2]. In order to study this process using the atomistic molecular dynamics simulations, a good interatomic potential is required to reproduce the mechanical and thermal characteristics of material in a wide range of pressures and temperatures, which ensures realistic simulation of motion of heated target. We have developed such a potential for lithium fluoride, and also carried out its verification on known experimental data. The threshold of energy density obtained from our simulation results is in a good agreement with the experimental data. The new potential can be used not only in problems with x-ray radiation, but also in simulations related to shock-wave physics, since it reproduces well the experimental shock Hugoniot.

[1] Seidgazov R and Mirzade F 2022 *Tech. Phys. Lett.* **48** 12

[2] Perov E A, Zhakhovsky V V, Inogamov N A, Shepelev V V, Fortova S V and Doludenko A N 2023 *Matematicheskoe Modelirovanie i Chislennyye Metody* **4** 74–92