

MATHEMATICAL MODELING OF SPALLATION OF CONDENSED MATTER UNDER THE INFLUENCE OF CONCENTRATED ENERGY FLOW

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Abstract. The process of spallation a solid aluminum target under the influence of an ultrashort laser pulse is considered. Modeling was carried out using the method of dynamic adaptation with explicit front tracking. The pulse duration was 100 ps - 1 fs, fluence was selected from a range of 0.1 - 1 J/cm². Tensile strength was determined using the molecular dynamics simulation. Modeling allowed to determine the thickness of the spallated layer, investigate the regimes in which spallation occurs in melt and solid. Also regimes where discovered where spallation occurs in solid in the absence of melting.