Numeral modeling of transformation of the particle flow from the free surface of Pb and Sn samples into gas medium

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The work presents the results of numerical modeling of experiments carried out using proton radiography [1] and synchrotron radiation [2] to record the process of particle ejection from a free metal surface into a low-density medium (gas) after the impact of a shock wave on this surface. Numerical modeling was carried out using the developed model of particle flow evolution in a gas medium, which is based on the model of the "source" of shock wave ejection of metals, associated with the physics of the Richtmeyer–Meshkov instability [3], and the laws of crushing of a single liquid particle in a gas flow [4]. A satisfactory agreement of the numerical simulation results with experiments are shown. This indicates that in order to predict changes in the characteristics of shock wave ejection in time (density, velocity and spectral sizes of particles), it is necessary to take into account both the "primary" spectrum of particle sizes formed during the decay of micro-cumulative jets and the mechanism of a single particle crushing.

[1] Zamyslov D N and et al 2019 *Proceedings of the Conference "XXI Kharitonov Thematic Scientific Readings"* 156–164
[2] Ten I A and et al 2017 *Proceedings of the Conference "XIX Kharitonov Thematic Scientific Readings"* 204–211
[3] Georgievskaya A and Raevskiy V 2017 *J. of Dyn. Beh. of Mat.* **3** 321–333
[4] Anisiforov K V and et al 2023 *JEPT* **167**