

# Detection of micro- and nanoparticles in dynamic processes

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In a shock impact on a metal plate, particles of various sizes are emitted from the free surface (shock-wave “dusting”). The particle sizes range from a few microns to hundreds of microns [1]. The particle flow was assumed to include finer particles too, but the existing techniques cannot resolve them yet.

BINP have commissioned SYRAFEEMA (Synchrotron Radiation Facility for Exploring Energetic Materials), which enables measurement of small-angle x-ray scattering (SAXS) of synchrotron radiation (SR) from the collider VEPP-4M (energy of 4 GeV). The SR SAXS technique and precision measurement of passed SR were applied to studies of flows of nano- and micro-particles from free surface of various materials (copper, tin, and tantalum). Flows of nanoparticles were detected for the first time in impact of pressed HMX on foil of tin and tantalum. The density distributions along the microjets formed from micron-sized slots were obtained.

[1] De Resseguier T, Loison D, Lescoute E, Signor L and Dragon A 2010 *J. Theor. Appl. Mech.* **48** 957–972