Meso-macro momentum exchange and steady-wave propagation
YURY MESHCHERYAKOV, Institute for Problems in Mechanical Engineering RAS

— Mechanism of meso-macro momentum exchange is incorporated into steady-wave shock solution grounded on the dislocation dynamics. As a test task, propagation of steady plastic front is considered and analytical solution for particle velocity is obtained. Experimental particle velocity profiles of Johnson and Barker for 6061-T6 aluminum alloy and D16 aluminum alloy are used for comparison with the theoretical profiles. Including the meso-macro momentum exchange into constitutive equation allows to fit experimental velocity profiles without increasing the initial dislocation density.