

PIC simulations of SNR's shock waves with a turbulent upstream medium

K.Fulat^{1,†}, M.Pohl^{1,2}, A.Bohdan², P.Morris²

¹ *Institute of Physics and Astronomy, University of Potsdam, 14476 Potsdam, Germany*

² *DESY, 15738 Zeuthen, Germany*

[†] karol.fulat@uni-potsdam.de

Investigation of astrophysical shocks has a major importance in understanding physics of the cosmic rays acceleration. Electrons to be accelerated at shocks must have an injection energy, which implies that they should undergo some pre-acceleration mechanism. Many numerical studies examined possible injection mechanisms, however most of them considered homogenous upstream medium, which is unreal assumption for astrophysical environments. We will to investigate electron acceleration at high Mach number and low plasma beta shocks using 2D3V particle-in-cell simulations with a turbulent upstream medium. Here we discuss the method of the generation of the compression-dominated turbulence and its quasi-seamless insertion into the upstream medium in the shock simulation. The modelled turbulence is sufficiently long-lived, and its parameters represent the high-Mach-number and low-beta regime.