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

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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 method of generation of the compression-dominated turbulence. It is sufficiently long-living to be inserted into a shock simulation, as well as their parameters represent the high Mach number and low beta regime.

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