

Large-amplified magnetic field structure at the high-Mach number shock front

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We investigate the structure of the transition region of weakly-magnetized strong shock waves of $Ma \sim 100$. We find small-scale and large-amplified magnetic field structure at the shock front, through their generation process, the electrons as well as ions are energized. The large-amplified magnetic field structure is generated by accelerated trapped-electrons at the separatrix of deep potentials due to the fluctuations on the ion acoustic mode, which are kept by the strong electron heating. Our results are obtained by the 1D particle-in-cell numerical simulation with mass ratio (ion to electron) of 100.