



Electron physics in shock waves

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The non-relativistic shocks that we find in the solar wind (no matter if driven by CMEs or encounters with planets) are dominated by ion dynamics. Therefore a detailed treatment of electrons is often neglected to gain significant reductions in computational effort.

With recent super computers and massively parallel codes it is possible to perform self-consistent kinetic simulations using particle in cell code. This allows to study the heating of the electrons as well as the acceleration to superthermal energies. These energetic electrons are interesting for couple of reasons. e.g. as an influence on plasma instabilities or for the generation of plasma waves.