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**On the transition from electromagnetic to electrostatic shocks** ANNE STOCKEM, FREDERICO FIUZA, ELISABETTA BOELLA, GoLP/IPFN - IST, RICARDO FONSECA, GoLP/IPFN - IST; DCTI, ISCTE, LUIS SILVA, GoLP/IPFN - IST — Electrostatic and electromagnetic shocks are relevant in various unmagnetized scenarios. The first can be produced in the laboratory by the interaction of a laser with a near-critical density target and are of interest for the generation of quasi-monoenergetic ion beams, e.g. for cancer therapy, whereas electromagnetic shocks are more relevant in astrophysical scenarios. We explore the conditions under which these shocks are generated in a scenario of two colliding plasma slabs, each consisting of cold ions and electrons with non-zero temperature. The main features of the shock character are discussed as a function of the initial fluid velocity and the electron temperature, and the governing regimes are theoretically predicted, by considering the shock formation time scales and the relevant scales for the instabilities mediating the shock formation. Particle-in-cell simulations confirm the theoretical findings and show the transition between both regimes.

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