Contribution ID: **29** Type: **not specified**

Kinetic simulations of particle acceleration at collisionless shocks

Thursday 22 October 2015 09:35 (50 minutes)

I present some recent results of large particle-in-cell (PIC) and hybrid (kinetic ions-fluid electrons) simulations of particle acceleration at non-relativistic collisionless shocks.
Ion acceleration efficiency and magnetic field amplification are investigated in detail as a function of shock inclination and strength, and compared with predictions of diffusive shock acceleration theory. In particular, I discuss how ions are injected in the acceleration process, also putting forward a minimal model able to reproduce spectrum and normalization of the supra-thermal particles. Moreover, I show full PIC simulations attesting to electron diffusive acceleration at shocks with different inclinations, also discussing the role of ion- and electron-induced instabilities. Finally, I outline the observational counterparts of such a theory of ion acceleration in supernova remnants and heliospheric shocks.

Author: CAPRIOLI, Damiano (Princeton University)

Presenter: CAPRIOLI, Damiano (Princeton University)

Session Classification: Thursday Morning 1