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Probing particle acceleration in lower hybrid turbulence via synthetic diagnostics produced by PIC simulations[1] F. CRUZ, R.A. FONSECA, L.O. SILVA, GoLP/IPFN, Instituto Superior Tecnico, Lisbon, Portugal, A. RIGBY, G. GREGORI, Clarendon Laboratory, University of Oxford, UK, R.A. BAMFORD, R. BINGHAM, RAL Space, STFC, UK, M. KOENIG, LULI, Ecole Polytechnique, France — Efficient particle acceleration in astrophysical shocks can only be achieved in the presence of initial high energy particles. A candidate mechanism to provide an initial seed of energetic particles is lower hybrid turbulence (LHT). This type of turbulence is commonly excited in regions where space and astrophysical plasmas interact with large obstacles. Due to the nature of LH waves, energy can be resonantly transferred from ions (travelling perpendicular to the magnetic field) to electrons (travelling parallel to it) and the consequent motion of the latter in turbulent shock electromagnetic fields is believed to be responsible for the observed x-ray fluxes from non-thermal electrons produced in astrophysical shocks. Here we present PIC simulations of plasma flows colliding with magnetized obstacles showing the formation of a bow shock and the consequent development of LHT. The plasma and obstacle parameters are chosen in order to reproduce the results obtained in a recent experiment conducted at the LULI laser facility at Ecole Polytechnique (France) to study accelerated electrons via LHT. The wave and particle spectra are studied and used to produce synthetic diagnostics that show good qualitative agreement with experimental results.

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