

TITLE: POLARIZATION SPECTRA FROM PIC SIMULATIONS OF COLLISIONLESS SHOCKS

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#### ABSTRACT

Collision less shocks generated by counter propagating plasma flows mediated by Weibel or Current Filamentation Instability ( WI or CFI ) may be the origin of Gamma Ray Bursts (GRBs) and cosmic ray acceleration. These instabilities can also strongly amplify seed magnetic field, leading to synchrotron and other radiation processes originating from particle scattering or self generated WI or CFI magnetic fields. In this work we present PIC particle in cell simulations of shocks generated by colliding electron positron plasmas. Using multidimensional simulations we examine the dynamics of plasma particles in the magnetic filaments generated at the shock front and explore the corresponding polarization signatures. We find that plasma particles can get trapped in these filaments leading to radiation bursts as a result of their jitter motion. Further, we examine the polarization signatures of the radiated spectra and analyse the radiated energy attributed to different polarizations. Such analysis is of special significance towards deeper understanding of bright afterglows produced when relativistic jets emanating from accreting black holes collide with ambient medium.