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Magnetized Weibel filaments as a source of circularly polarized light UJJWAL SINHA, JOANA MARTINS, JORGE VIEIRA, GoLP/Instituto de Plasmas e Fusao Nuclear, Instituto Superior Tecnico, Universidade de Lisboa, Lisbon, Portugal, RICARDO FONSECA, DCTI, ISCTE-Lisbon University Institute, Lisbon, Portugal, LUIS SILVA, GoLP/Instituto de Plasmas e Fusao Nuclear, Instituto Superior Tecnico, Universidade de Lisboa, Lisbon, Portugal — We investigate radiation spectra of plasma particles trapped in Weibel filaments generated from multidimensional particle in cell simulations with OSIRIS in magnetized and unmagnetized plasmas. We show that an important parameter determining polarization of emitted radiation is the magnetization of ambient media. Polarization of radiation emitted during counter-propagating plasma flows with different magnetizations is explored by extracting trajectories of particles sampled from PIC simulations and computing their radiation spectrum. Particle trajectories in magnetized plasmas undergo EXB drift at Weibel boundaries leading to a preferential drift direction, whereas, in unmagnetized case the particles have no net drift. As a result, significant fraction of radiated energy from magnetized filament is circularly polarized (CP). Energy attributed to different polarizations is calculated by measuring degree of polarizations. With increasing magnetization, the fraction of radiated energy attributed to CP increases. The direction of circular polarization also changes with direction of applied magnetic field. The study is of significance for understanding radiation from Gamma Ray Bursts.

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