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Electron acceleration by pressure anisotropy instabilities under solar flare plasma conditions[1] MARIO RIQUELME, ALVARO OSORIO, University of Chile, LORENZO SIRONI, Columbia University, DANIEL VERSCHAREN, University College London — We use particle-in-cell (PIC) simulations to show that pressure anisotropy instabilities can stochastically accelerate electrons in plasmas with temperatures, magnetic fields and densities suitable to solar/stellar flares. Using a setup where the global magnetic field grows, we self-consistently produce the growth of electron pressure anisotropy, driving different electron scale plasma modes unstable (whistler and z-modes). In the regime $\omega_{ce}/\omega_{pe} \sim 1$ (where ω_{ce} and ω_{pe} are the electron cyclotron and plasma frequencies, respectively), and after the instabilities have reached their non-linear, saturated regime (after the global magnetic field has been amplified by a factor ~ 3), the electron energy spectrum can develop a power-law tail with indices between ~ 2 and 3, and reach $\sim$MeV energies.

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