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Signatures of Heating via Landau Damping in Nearly Collisionless Plasmas[1] KRISTOPHER KLEIN, Univ of New Hampshire, GREGORY HOWES, Univ of Iowa — It is an open scientific question what mechanisms act to convert large scale turbulent fluctuations into particle heating for nearly collisionless plasmas. One potential mechanism is Landau damping, which generates small scale structures in velocity space; once the gradients of these structures become sufficiently large, weak collisions can act to irreversibly heat the plasma. We consider the case of Landau damping for the gyrokinetic system of equations. An analytic expression for the time evolution of the particle velocity distribution function (VDF) is calculated using a Fourier-Laplace transform. This expression is then compared to VDFs generated using the gyrokinetic code AstroGK. From these expressions and simulations, we construct a set of signatures using VDFs which serve to identify the presence of Landau damping in the solar wind and other turbulent, nearly collisionless plasmas.

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Kristopher Klein
Univ of New Hampshire

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