# CLUES ON THE TURBULENT GALACTIC MAGNETIC FIELD FROM WAVE ENERGY DISSIPATION BY LINEAR LANDAU DAMPING IN THE INTERSTELLAR MEDIUM

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The heating rate of the diffuse interstellar medium is calculated from collisionless dissipation of magnetohydrodynamic plasma waves by linear Landau damping. We demonstrate that, when considering individual plasma wave types, two factors are of importance. First, the approximations and conditions under which the wave damping rates are produced must be honored to ensure that one does not step outside the domain of validity of the approximation. Second, when integrating over a wave spectrum due care and diligence must be given in performing the integrals as accurately as possible and not approximating too early in the development. Failure to take such care can lead to inappropriate wave energy loss rates which do not reflect correctly the exact expressions. The numerical estimates produced for linear Landau damping indicate that there is little, if any, disparity between radiative cooling rates and wave energy loss rates for the fluctiferous (H II-regions) and the diffuse interstellar medium when the anisotropy in the wave power spectrum is properly accounted for. Our results show that the interstellar turbulence mostly consists of obliquely propagating compressive fast magnetosonic waves. However, the power spectrum of these waves is not isotropic in wavenumber space but has to be very anisotropic, either elongated mainly along or perpendicular to the ordered magnetic field component.