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Damping of Waves in MHD Turbulence

Jungyeon Cho[1], Alex Lazarian[2]
[1] Department of Astronomy and Space Science, Chungnam National University, Korea (ROK),
[2] Department of Astronomy, University of Wisconsin – Madison, USA
e-mail (speaker): jcho@cnu.ac.kr

In astrophysical fluids, waves can be generated by streaming instability or other MHD sources. The amplification of the waves critically depends on the damping rate of them. We discuss damping of waves in MHD turbulence. First, we briefly talk about structure of MHD turbulence in a strongly magnetized medium, which plays important roles in wave decay. In particular, we will discuss how anisotropic structure of MHD turbulence in the presence of a strong mean magnetic field affects particle scattering and wave damping. Second, we present numerical simulations of wave damping in strongly magnetized medium. We mostly use an incompressible MHD code and measure wave damping rate using two different methods. We also discuss physical process that determine the wave damping rate in turbulence. Third, we discuss implications of our findings. Especially, we discuss how wave damping by turbulence influence the development of linear instabilities in a turbulent medium.

References
[1] Cho, J. & Lazarian, A. in preperation
[2] Farmer, A. & Goldreich, P. 2004, ApJ, 604, 671
[3] Beresnyak, A. & Lazarian, A. 2008, ApJ, 678, 961

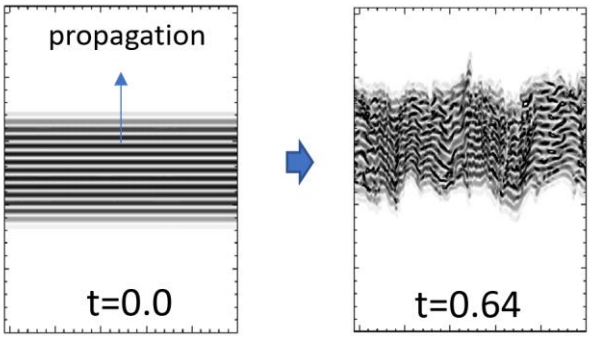

Figure 1. Propagation of a wave in turbulence. Due to wave-turbulence interaction, the wave suffers from deformation and damping.