[구IM-01] Modeling the Galactic Rotation Measure at High Galactic Latitude Using MHD Turbulence Simulations

Takuya Akahori[1], Dongsu Ryu[1] and Jongsoo Kim[2]
[1]Chungnam National University, [2]Korea Astronomy and Space Science Institute

Recently, Faraday rotation measure (RM) at high Galactic latitude has been investigated, partly to explore the Galactic magnetic fields and partly to study the extragalactic magnetic fields. The Galactic contribution to RM comes from the global component as well as the turbulent component. So far the turbulent field was used to be analytically modeled with a Kolmogorov-type power spectrum. Here, we present the initial results of the work where the turbulent field is modeled using data of MHD turbulence simulations. Our work is intended to be applied to simulations of RM surveys with LOFAR, ASKAP, MeerKAT, and SKA.

[구IM-02] MHD turbulence in expanding/collapsing media

Junseong Park, Dongsu Ryu, Jungyeon Cho
Department of Astronomy and Space Science, Chungnam National University, Daejeon, Korea

We investigate the driven magnetohydrodynamic (MHD) turbulence by including the effect of the expansion and collapse of background medium. The main goal is to quantify the evolution and saturation of the strength and characteristic length scales of magnetic fields in expanding and collapsing media. Our findings are as follows. First, with the expansion and collapse of background medium, the time evolution of the magnetic and kinetic energy densities depends on the nature of forcing as well as the rate of expansion and collapse. Second, at scales close to the energy injection (or driving) scale, the slope of magnetic field power spectrum shallows with expansion but steepens with collapse. Third, various characteristic length scales, relative to the energy injection scale, decrease with expansion but increase with collapse. We discuss the astrophysical implications of our results.