[IM01] Jeans-Parker Instability in a Self-Gravitating, Magnetized, Gaseous Disk under an External Gravity: Three-Dimensional MHD Simulations

Y.M. Seo[1], S.S. Hong[1], S.M. Lee[2] and J.S. Kim[3]
[1]*Astronomy Division, Department of Physics and Astronomy, Seoul National University,*
[2]*Supercomputing Center, Korea Institute of Science and Technology Information,*
[3]*Korean Astronomy and Space Science Institute*

We have made three-dimensional MHD simulations of the Jeans-Parker instability in a self-gravitating, magnetized, gaseous disk under the influence of an external gravity, and examined whether the instability could be a route to bear such large structures as HI super-clouds and GMCs in the Galactic ISM disk. Linear stability analysis of the Jeans-Parker instability indicates that the undular Parker mode would grow faster than the Jeans gravitational instability under the canonical conditions of the Galactic ISM disk. Consequently structures of the GMC scale would form first and then they merge to make HI super-clouds. This is confirmed by our non-linear MHD simulations. Some observable consequences will be calculated from the simulation results and compared with the relevant observations.

[IM02] A near-IR study of the active star-forming region W51B

Hyosun Kim[1], Yasushi Nakajima[2],
Hwankyung Sung[3], Dae-Sik Moon[4], and Bon-Chul Koo[1]

[1]*Astronomy Division Department of Physics and Astronomy, Seoul National University,*
[2]*Optical and Infrared Astronomy Division, National Astronomical Observatory of Japan,*
[3]*Department of Astronomy and Space Science, Sejong University,*
[4]*Robert A. Millikan Fellow, Division of Physics, Mathematics, and Astronomy, California Institute of Technology*

We present near-infrared JHK_s-band photometric observations of the three compact HII regions (G48.9-0.3, G49.0-0.3, and G49.2-0.3) in the active star-forming region W51B using the 5-m Palomar Hale telescope. The mean color excess ratio (E_{J-H}/E_{H-Ks}) towards W51B is ~2.08. We identify star clusters inside the three compact HII regions, and they show the excess number of stars in the $J-K_s$ histograms compared with reference fields. The average visual extinctions are 18, 17, and 22 mag for G48.9-0.3, G49.0-0.3, and G49.2-0.3, respectively. From the inferred Lyman continuum flux of the O-type members, we roughly estimate the age of the HII regions are younger than 1 Myr. Their K_s-band luminosity functions have steep slopes which are compared with those of other clusters. The overall star formation efficiency suggests that W51B is one of the most active star forming regions in the Galaxy.