

and the spin parameter of $\lambda=0.049$. The two substructures appear to have passed each other 4.4 Gyr ago and are moving away to the maximum separation.

[ㄱ GC-09] Probing galactic and intergalactic magnetic fields using Faraday tomography (optionally title in Korean in parentheses)

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For probing magnetic fields in the universe, rotation measure (RM) have been often used. RM allows us to obtain the information of integrated (or averaged) magnetic fields along a line of sight (LOS). On the other hand, the new technique so-called Faraday tomography will be used in practical in the near future thanks to the wide-band polarimetry by Square kilometre Array and/or its precursors. The technique allows us to obtain so-called Faraday dispersion function (FDF). FDF is the distribution function of magnetic fields and polarized sources along a LOS. Because of this fact, it is expected that the studies of magnetic fields associated with various astronomical objects will progress dramatically. Since FDF also includes information of cosmic-rays and thermal electrons, the investigation of FDF may advance the studies of dynamics of external galaxies and/or the star formation activities.

We have studied the potentials of Faraday tomography such as a tool to probe the intergalactic magnetic field associated with filaments of galaxies in the large scale structure. We have also studied the realistic FDFs of galaxies for understanding global magnetic field, cosmic-ray and thermal electrons of external galaxies. In the talk, we briefly introduce the Faraday tomography technique and report the results related to the Faraday tomography.

[ㄱ GC-10] Near-Infrared Polarization Source Catalog of Northeastern Regions in the Large Magellanic Cloud

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We present a near-infrared photometric and polarimetric catalog of sources in the 39' × 69' fields on the northeastern part of the Large Magellanic Cloud (LMC), which was observed using SIRPOL, an imaging polarimeter of the Infrared Survey Facility (IRSF). This catalog contains 1,858 sources brighter than 14 mag at H band with polarization signal-to-noise ratio greater than 3 in at least one of J, H, and Ks bands. We examined the polarization structures around the star-forming regions, where coherent polarization position angle distributions are seen. We also estimated magnetic field strengths in some selected fields using Chandrasekhar and Fermi analysis. The magnetic field strengths are estimated to be 3 ~ 25 μ G. The wavelength dependence of polarization degrees indicates that the polarization is most likely to be originated from dichroic extinctions by the local interstellar dusts in the LMC. We found that the polarization patterns are well aligned along the molecular clouds around star-forming regions.

[ㄱ GC-11] ISM Properties and Star Formation Activities in IC 10 : 2D Cross Correlation Analysis of Multi-wavelength data

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We present the physical properties of star forming regions in IC 10 obtained from Korea VLBI Network (KVN) 22GHz, the Submillimeter Array (SMA) CO, Very Large Array (VLA) HI 21cm, optical (U, B, V and H-alpha), and Spitzer infrared observations. IC 10 is a nearby (~0.7Mpc) irregular blue compact dwarf (BCD) galaxy which is likely to be experiencing an intense and recent burst of star formation. This nearby infant system showing high star formation rate but low metallicity (<20% of that of the Sun) provides critical environment of interstellar medium (ISM) under which current