[IM05] [Fe II] and H2 imaging and spectroscopic observations of the supernova remnant 3C 396

Ho-Gyu Lee[1], Bon-Chul Koo[1], Dae-Sik Moon[2], Jae-Joon Lee[1] and Keith Matthews[3]

[1]*School of Physics and Astronomy, FPRD, Seoul National University,*
[2]*Department of Astronomy and Astrophysics, University of Toronto*
[3]*California Institute of Technology, Downs Lab, MS 230-47, Pasadena, CA 91125*

We have carried out near-infrared [Fe II] and H2 imaging and spectroscopic observations of the supernova remnant (SNR) 3C 396. 3C 396 is a composite-type remnant aged about 7000 years. Along the radio-bright western shell, the long filamentary mid-infrared emission had been detected in Spitzer IRAC and MIPS bands. Our [Fe II] 1.64 um image shows widely spread emission features following the western shell coincident with mid-infrared features. On the other hand, H2 2.12 um emission is located at the outer boundary of radio shell. From spectroscopy observations, we detected several [Fe II] and H2 lines. Their line ratios constrain the physical parameters of shock, such as shock velocity, density, and temperature. We discuss the nature of the infrared emission related to SNR shocks.

[IM06] Internal Structure and Physical Properties of Molecular Cloud Cores

Kwon, Suk Minn
Dept. of Science Education, Kangwon National University

In order to make systematic comparison of molecular cloud cores in their radio and infrared mophologies, we have analyzed IR images of 37 small dark cloud cores to determine such physical properties as dust optical depth, color temperature, IR emissivity distribution and density structure. Comparable in spatial resolution with the IRAS data, the 13CO integrated intensity maps obtained by a 4-m telescope of Nagoya University (Kwon & Fukui 1996) and SRAO 6-m telescope (Kwon et al. 2006) were compared with the 100 μm optical depth maps. We found that the peak intensity positions of 13CO emission for the most of the cores show better agreements with the peak positions of optical depth than those of 100 μm emission intensity. The morphological similarity between the radio map and the infrared optical depth map suggests that gas and dust are well mixed for the most of the cloud cores observed in the present study. We analyzed and compared internal density distributions of both gas and dust components statistically. For the most of the cores, the radial density distribution of the gas component is less steeper than that of an isothermal gas sphere. It should be noted that one must be cautious in determining cloud boundary by examining an emission intensity distribution alone, since that IR emission from a cloud can be contaminated by diffuse background emission component even at a high galactic latitude.