

Hidden He II Emission Line Region in the Planetary Nebula M2-9

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The bipolar planetary nebula M2-9 has been classified as a low ionization planetary nebula on the basis of the lack of high ionization emission lines such as He II 4686, 6560. From the spectrum of M2-9 obtained with the CTIO 1.5 m telescope, we found the emission feature at 6545 Å proposed to be the Raman scattered He II by atomic hydrogen, which implies the existence of the hidden He II emission region heavily obscured by the circumstellar region. Adopting a simple distribution of neutral hydrogen in the circumstellar region we perform photoionization computations to estimate the strength of the He II emission and compare with that of high ionization planetary nebulae.

Observations of Giant Molecular Clumps in the Inner Galaxy

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We observed two giant molecular clumps, which were identified in the Inner Galaxy using Bell Laboratories ^{13}CO Galactic Plane Survey, in CS, C^{18}O , HCO^+ , and C^{34}S with the 14m radio telescope at Taeduk Radio Astronomy Observatory (TRAO). Distances of the clumps were determined to be 3.5 kpc and 3.8 kpc, respectively, using Galactic rotation curve. Sizes and linewidths of two giant clumps are estimated to be about 9 pc and $4\sim 6 \text{ km s}^{-1}$ and their masses are in order of $10^3 M_{\odot}$, which are among the largest ones ever known in the inner Galaxy except Galactic Center Region. We derived several physical parameters of the clumps and analyzed their structures.