Near infrared IFU and MOS observations of supernova remnants
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Abstract
We present near-infrared integral field unit (IFU) and multi-object spectroscopy (MOS) observations of two bright [Fe II] line emitting supernova remnants (SNRs). The two SNRs, G11.2-0.3 and RCW103, are selected from our near-infrared [Fe II] 1.64 um narrow band imaging survey of SNRs such as UKIRT unbiased [Fe II] imaging survey of the Galactic plane and AAT [Fe II] imaging of some core-collapse SNRs. We detect several near-infrared hyperfine lines of [Fe II] at the southeastern shell of G11.2-0.3. We estimate the line strength and extinction-corrected density, which gives a clue to the origin of the iron-rich southeastern shell of G11.2-0.3. We obtain the MOS spectra of [Fe II]-emitting clumps inside RCW103. The observed clumps move about hundreds kilometers in radial direction, suggesting that they are shocked dense materials lost by stellar wind at the final stage of the evolution of the progenitor star.

[Fe II] line emitting SNRs
  - [Fe II] 1.64 μm narrow band imaging survey (gems.kasi.re.kr/uwife/)
  - 7° < l < 62°, -1.5° < b < 1.5°
  - Identified SNRs : see poster S10.10 (Lee, Y.-H.)
- 3C396 (Lee et al. 2009)
  - Palomar [Fe II], H₂
  - [Fe II] distributes outside H₂
  - H₂ along the inner edge of CO cloud
★ Pre-SN CSM shell inside molecular cloud

Near-IR IFU observation of G11.2-0.3
- IFU images & spectra
- Extinction & density maps
- High velocity component
★ Radiative model for radial profile
★ The observed [Fe II] emission can be explained by shock-heated gas with dense pre-existing CSM in general. But existence of high-velocity ejecta cannot be ruled out.

Near-IR MOS observation of RCW103
- [Fe II] & X-ray images
★ [Fe II] motion & center
★ Possible scenario
★ We suggest near-IR multi-positional spectroscopy as a tool to prove pre-supernova condition of the progenitor star.

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