# Wide Field Infrared Polarimetry: Dust and Magnetic Field in Star Forming Regions

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We are conducting large-scale near infrared polarization surveys of nearby star forming regions. The survey is based on our developed near-infrared (J, H, and Ks bands) simultaneous polarimeter SIRPOL mounted on the survey-dedicated telescope IRSF situated at Sutherland, South Africa, which can cover a large field of view of 7.7'x7.7'. The main purpose of the polarization survey is to study the dust properties and magnetic field structures in various star forming regions via multi-wavelength near-infrared polarimetry that can penetrate dusty regions.

In this contribution, we will present the results of the Orion and Monocerotis star forming regions, where we have found that the dust grains are aligned even in the region of at least Av ~several tens of magnitudes and the magnetic fields in the dense cloud core regions are well traced. The agreement is excellent between the field traced by the near-infrared dichroic polarimetry and that by the far-infrared/submillimeter thermal emission polarimetry. These results are also compared with our polarization survey of the Galactic center.

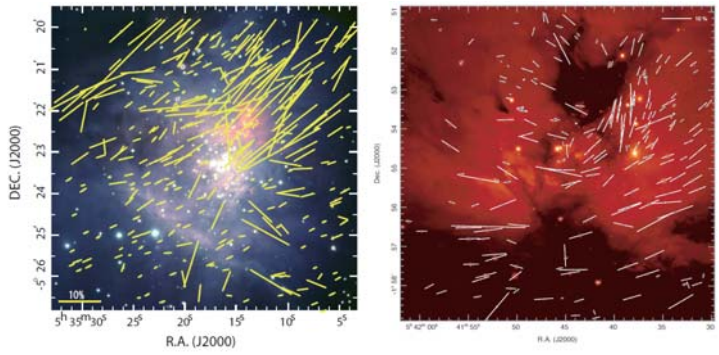


Figure 1. H-band (1.6 micron) aperture polarimetry of the point-like sources M42 and NGC2024 regions in Orion. Background is JHKs-band color composite or H-band surface brightness

## References

[1] M. Tamura et al., *Publ. of Astron. Soc. of Japan*, **59**, 467 (2007).
[2] R. Kandori et al., *Publ. of Astron. Soc. of Japan*, **59**, 487 (2007).
[3] N. Kusakabe et al., submitted to *Astron. J.* (2008)