Observation Status of Paα Galactic Plane Survey
01 Plan & Current Status

02 Preliminary Results

Whole region

\[ l = +280^\circ \text{ to } +350^\circ \]
\[ l = +350^\circ \text{ to } +050^\circ \]
\[ l = +050^\circ \text{ to } +110^\circ \]
\[ l = +110^\circ \text{ to } +170^\circ \]
\[ l = +170^\circ \text{ to } +230^\circ \]

RCW 57 (2° × 2° area)

03 Pa α Pointing Observations

Summary & Future Work
Plan & Current Status

- Cover 360° along Galactic plane within $-3^\circ < b < +3^\circ$
- **Total 232 fields**: 106 north fields + 106 south fields + 20 extended.
- Effective exposure: $\sim 20$ minutes per field per filter.

- 2014 Apr.–2014 Aug.: $l = -80^\circ$ to $+100^\circ$ (completed).
- 2014 Nov.–2015 Mar.: $l = +100^\circ$ to $+280^\circ$ (on going).
Plan & Current Status

- Cover 360° along Galactic plane within $-3^\circ < b < +3^\circ$
- **Total 232 fields**: 106 north fields + 106 south fields + 20 extended.
- Effective exposure: $\sim 20$ minutes per field per filter.

- Up to 2015 Jan. 26,
  179 fields have been covered ($\sim 77.2\%$ completed).
Preliminary Results

◆ Whole region

• Incompletely processed images: no removal of detector background, no on-orbit flat field correction, no flux calibration.
• Pa\(\alpha\) emission line image was made using fixed scale factor (0.55) subtraction: PAAL – 0.55 × PAAC.
Preliminary Results

$l = +280^\circ$ to $+350^\circ$

*Top*: Hα image (Finkbeiner, 2003)

*Middle*: MIRIS Paα image

*Bottom*: SFD E(B−V) dust image (Schlegel et al. 1998)

NGC 6334  RCW 108  RCW 75  RCW 57  Carina Nebula
Preliminary Results

\[ l = +350^\circ \text{ to } +050^\circ \]

*Top*: H\( \alpha \) image (Finkbeiner, 2003)

*Middle*: MIRIS Pa\( \alpha \) image

*Bottom*: SFD E(B\(-\)V) dust image (Schlegel et al. 1998)

- W 51
- W 40
- Eagle Nebula
- Omega Nebula
- Galactic Center
Preliminary Results

$\pm l = +050^\circ$ to $+110^\circ$

*Top*: Hα image (Finkbeiner, 2003)

*Middle*: MIRIS Paα image

*Bottom*: SFD E(B−V) dust image (Schlegel et al. 1998)
Preliminary Results

\( l = +110^\circ \) to \( +170^\circ \)

*Top*: H\( \alpha \) image (Finkbeiner, 2003)

*Middle*: MIRIS Pa\( \alpha \) image

*Bottom*: SFD E(B-V) dust image (Schlegel et al. 1998)

Markers: Sh2-205, Heart Nebula, NGC7822
Preliminary Results

- $l = +170^\circ$ to $+230^\circ$

*Top:* H$\alpha$ image (Finkbeiner, 2003)

*Middle:* MIRIS Pa$\alpha$ image

*Bottom:* SFD E(B$-$V) dust image (Schlegel et al. 1998)
Preliminary Results

- RCW 57 region (2° × 2° area)

**Images:**
- SHASSA H\(\alpha\) image
- MIRIS Pa\(\alpha\) image
- SFD E(B–V) dust image (with star–forming regions)
03 Pa $\alpha$ Pointing Observations

◆ Plan & Current Status

- Nearby H II regions on the Gould Belt: Orion, $\lambda$ Orionis, IC434, Barnard Loop, Rosette, Gum, California, Zeta ophiuchi
- Star-forming Clouds: Rho ophiuchi, BFS11–B, Mon R2, NGC1579, Perseus cloud.
- Nearby Galaxies: M31, SMC, LMC
- Planetary Nebulae: Helix Nebula
Pa α  Pointing Observations

◆ Preliminary Results : LMC

1.1 μm band filter
1.6 μm band filter
Pa α line filter
Pa α dual continuum filter

30 Doradus Nebula
RGB Image By J. H. Pyo
Summary & Future Work

◆ Many of detected Paα features are brighter than predicted by the Hα observations (some of them are invisible in Hα).
◆ Bright Paα blobs coincide well with dense cloud regions.

→ Since Paα recombination line suffers much less from dust attenuation than Hα line, it can detect H II regions screened by clouds.
→ Bright Paα blobs seem to be from young massive star formation regions within clouds.

◆ Data reduction: removal of detector background, on–orbit flat field correction, flux calibration, re–estimate the scale factor of PAAL & PAAC (spatially variable).
◆ Remove point sources and then complete diffuse Paα emission line map.

→ Catalog newly detected Paα blob sources.
→ Compare with Radio survey data (radio recombination line, radio continuum) as well as Hα data, and then estimate foreground extinction and dust scattering effects.