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INFRARED POLARIZATION OF THE MOLECULAR CLOUD ASSOCIATED TO IRAS 18236-1205

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We present the near-infrared polarization observations towards the star forming molecular cloud associated with the IRAS source 18236-1205, obtained with the near-infrared (NIR) imaging polarimeter POLICAN at the Guillermo Haro Astrophysical Observatory in Cananea, Sonora, México.

The star formation in the molecular cloud associated to the IRAS 18233-1205 is a discontinuous process in the 20 parsecs scale. The center of the cloud was recognized as an UC-H II region associated with dense molecular gas traced with CS(2-1) by Bronfman et al. (1996). The complete molecular cloud was defined with ^{13}CO emission by Retes et al. (2009). It appears like a collection of elongated infrared dark clouds traced at *Spitzer* 8 μm, which is correlated with a continuous dark cloud observed in the NIR K-band. The star formation activity at early stages occurring in this cloud is observed indirectly by the presence of several tracers, with the earliest ($\sim$0.3 Myr) event of massive star formation associated to the IRAS source (Retes et al. 2011).

We produce a complete map of starlight polarization measurements towards the molecular cloud obtained in NIR H-band using POLICAN (Devaraj et al. 2015) instrument. Figure 1 shows background ^{13}CO total integrated intensity map of the cloud with the bipolar outflow of the massive star (red and blue arrows) obtained from López-Sepulcre et al. (2010). Overplotted in black vectors are the H-band polarization measurements of background stars with $J - H > 1$. The polarization vectors represent the plane-of-sky (POS) direction of the magnetic field (B-field) based on dichroic extinction from dust grains in the cloud. The outflow from the massive star is in the densest region of the cloud associated with high extinction. An interpolation of the surrounding polarization measurements show orientation of the POS B-field projected parallel to the direction of the outflow.

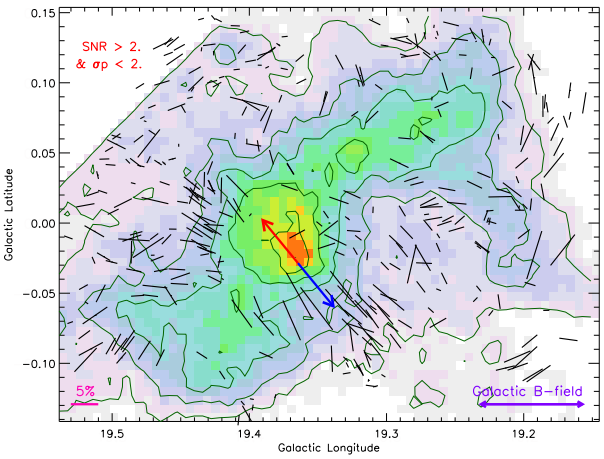

Fig. 1. The molecular cloud associated to the IRAS 18233-1205 is traced in ^{13}CO integrated emission (with green contours). At the central densest region is the bipolar outflow indicated by red and blue arrows. The H-band polarization measurements using POLICAN is traced with black vectors for background stars with $J - H > 1$, having SNR>2 and error in polarization<2.

The B-field directions seen around the central region show a general trend that is oriented perpendicularly to the long-axis of the molecular cloud. This direction was also confirmed from large scale polarization observations by *Planck* at 353 GHz. The B-field deviation from the local galactic B-field is $\simeq$30°. Comparing the distribution of POS B-field and the long-axis of the cloud, it can be interpreted that the cloud may be magnetically regulated and would have gravitationally condensed along the B-field (Nakamura & Li 2008).

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