Magnetic Fields in Star-Forming Molecular Clouds: JCMT Polarimetry of OMC-3 in Orion A

Brenda C. Matthews

Christine D. Wilson
McMaster University

ABSTRACT

Polarimetric images of the OMC-3 region of the Orion A filamentary molecular cloud are presented. Using the new imaging polarimeter on the JCMT, we have detected polarized thermal emission at 850 μm from dust along the dense filament. Part of the so-called integral filament, active star formation is in evidence, with only two of nine observed condensations lacking evidence of outflow. The polarization pattern is aligned with the long axis of the filament throughout most of the region, diverging only near the southern boundary by between 30 and 50 degrees. This configuration indicates a plane-of-sky magnetic field which is normal to the filament along most of its length, if the polarization arises from thermal emission of dust grains aligned by the magnetic field via the Davis-Greenstein mechanism. The mean percentage polarization measured is 4.1% with a maximum of 9.8% with S/N$>$ 6.