Star Formation and Magnetic Field Structure along the OMC-3 Ridge in Orion A

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OMC-3 is part of the so-called Integral Filament in the Orion A molecular cloud. Located at its northern tip, this ridge contains nine embedded dust condensations. Data from the Owens Valley interferometer support previous work which reveals that two of the condensations do not yet show evidence of collapse. The SCUBA polarimeter at the James Clerk Maxwell telescope has been used to measure polarization from aligned dust grains at 850 microns along the 6 arcminute ridge. The polarization patterns reveal the net plane-of-sky magnetic field orientations. A recently developed model of filamentary clouds utilizes helical magnetic fields to support and shape the filament (Fiege & Pudritz, 2000, MNRAS, 311, 85). This model predicts polarization patterns like that observed in OMC-3. Additionally, the depolarization (decreased polarization percentage) along the bright spine of the ridge is predicted by the helical field model and is observed both toward the dust condensations and toward the filament alone. This provides evidence that the features seen in JCMT maps are likely dominated by the filament, not the individual condensations.