A SIGNIFICANT POPULATION OF CANDIDATE NEW MEMBERS OF THE RHO OPHIUCHI CLUSTER
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ABSTRACT
We present a general method for identifying the pre-main-sequence population of any star-forming region, unbiased with respect to the presence or absence of disks. We have applied this technique to a new, deep, wide-field, near-infrared imaging survey of the ρ Ophiuchi cloud core to search for candidate low mass members. In conjunction with published Spitzer IRAC photometry, and least squares fits of model spectra (COND, DUSTY, NextGen, and blackbody) to the observed spectral energy distributions, we have identified 948 candidate cloud members within our 90% completeness limits of J = 20.0, H = 20.0, and Ks = 18.5. This population represents a factor of ~3 increase in the number of known young stellar objects (YSOs) in the ρ Ophiuchi cloud. A large fraction of the candidate cluster members (81% ± 3%) exhibit infrared excess emission consistent with the presence of disks, thus strengthening the possibility of their being bona fide cloud members. Spectroscopic follow-up will confirm the nature of individual objects, better constrain their parameters, and allow an initial mass function to be derived.

J, H, and Ks Observations
- IRIS2 on the Anglo-Australian 4.0 meter telescope
- IRIS2 plate scale 0.45 arcsec/pixel
- Filters used: IRIS2 J (1.245 μm), Ks (2.144 μm), H = CH4s (1.570 μm) + CH4l (1.690 μm)
- Total on-source integration time at each position was 5 minutes for the J and Ks filters, and 16 minutes for H-band
- 90% completeness limits: J = 20.0, H = 20.0, Ks = 18.5
- Mass sensitivity: 90% complete to ~1.5 MJup for 1 Myr age and photospheric temperature of ~1100K at 124 pc for Ap = 0; falls to 2.0, 4.0, and 8.5, and 10 MJup for Ap = 5, 10, 15, and 20, respectively.

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