

Technical Page

Proposal Type: Regular
 General Category: Astronomy
 Sub-Category: Continuum
 Observation Category: Galactic
 Total Time Requested: 42 Hours

Proposal Title: The Origin of Magnetic Activity in Sub-Stellar Objects

ABSTRACT:

The processes of magnetic field generation, amplification and dissipation in sub-stellar objects are not understood, but could provide direct information on the internal convection and the structure of the atmosphere. The detection of radio emission from four late-M and L dwarfs by us and collaborators indicates that contrary to theoretical expectations and observations in other bands ($H\alpha$, X-rays), magnetic activity may be prevalent in sub-stellar objects. The enormous disjoint between the radio and $H\alpha$ /X-ray emission (a factor of 10^4) suggests that the magnetic dynamo may differ from that in early-type stars and thus require full observational inspection. Here we propose observations in the X-band with the WAPP correlator of 23 nearby L and T dwarfs to characterize the statistics of radio emission, determine a possible correlation with other physical properties (e.g., rotation) which might shed light on the nature of the magnetic dynamo, and assess the role of coherent emission in addition to the synchrotron radiation observed to date. With these observations we can for the first time investigate rapidly-varying flares with high spectral resolution, and at the same time detect faint persistent emission.

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Service Observing Request

Remote Observing Request

- None
- All of the observing run.
- Part of the observing run.
- Queue Observing

- No
- Maybe
- Yes

Instrument Setup

X-high

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned