Technical Page

This proposal has not been submitted before.

Proposal Type: Regular
General Category: Astronomy
Sub-Category: Continuum
Observation Category: Galactic
Total Time Requested: 100 Hours
Minimum Useful Time: 2 hours

Proposal Title: Timing the periodically flaring ultracool dwarfs, TVLM 513-46546, 2M J0746+2000, and LSR 1835+3259

ABSTRACT:

We have recently used the Arecibo telescope and the Mock spectrometer to make timing measurements of an ultracool dwarf (UCD), TVLM 513-46546, at 5 GHz. The astonishing result of these measurements was that the 1.96 hour period of radio flares from this object had been systematically decreasing over 6 months in 2012/2013 at the average rate of 10 ms/day. A plausible explanation of this effect is that it is caused by a differential rotation of the dwarf, combined with the migration of radio active regions toward the equator, in a manner similar to the behavior of sunspots that create the famous "butterfly" diagram for the Sun. If true, this would be the first detection of a differential rotation of an UCD, and a demonstration of the usefulness of flare timing as a tool to better understand the internal structure of these objects. We propose to observe TVLM 513 and two other similar UCDs to verify the above idea and to explore any alternative interpretations of our observations.

<table>
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<tr>
<th>Name</th>
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<tbody>
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Remote Observing Request

- Observer will travel to AO
- X Remote Observing
- In Absentia (instructions to operator)

Instrument Setup

C

Atmospheric Observation Instruments:
Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

4200 - 5100