Technical Page

Proposal Title: A survey of OH toward dark cloud cores observed by SWAS

ABSTRACT:

Oxygen is the third most abundant element in the interstellar space, and thus O-chemistry must be understood in order to fully understand chemical processes in space. The Submillimeter Wave Astronomy Satellite (SWAS) has detected spatially extended H₂O emission from several giant molecular cloud cores, but only upper limits to the water abundance could be established for three dark cloud cores (TMC-1, L134N and B335, Snell et al. 2000). SWAS, however, failed to detect O₂ emission from the observed GMCs as well as the dark cloud cores. A tentative detection was reported by Goldsmith et al. (2002) in the rho-Oph cloud core region (not observable from Arecibo). The OH radical is a crucial intermediary in the Oxygen chemical network (Sternberg and Dalgarno 1995) and thus the OH abundance can provide insight into the chemistry of O-bearing molecules. Here, we propose to observe the $^3\Pi_{3/2} J = 3/2 F = 1 - 2 (1612\text{MHz}), F = 1 - 1 (1665\text{MHz}), F = 2 - 2 (1667\text{MHz})$ and $F = 2 - 1 (1720\text{MHz})$ OH lines toward the three dark cloud cores observed by SWAS and also two well-studied regions: L1544, a pre-stellar core, and NGC1333, an active site of low-mass star formation where shock chemistry is at work.

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<tr>
<th>Name</th>
<th>Institution</th>
<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luca Olmi</td>
<td>Institute of Radio Astronomy</td>
<td><a href="mailto:olmi@arcetri.astro.it">olmi@arcetri.astro.it</a></td>
<td>+39-055-2752214</td>
<td>no</td>
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Service Observing Request

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

Remote Observing Request

☐ No
☐ Maybe
☐ Yes

Instrument Setup

L-wide

Atmospheric Observation Instruments:
Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

1605 - 1730

This proposal requires Iridium RFI protection at 1612 MHz between 10pm and 6am EST.