Proposal Identification No.: A1610

Technical Page

Proposal Type: Regular
General Category: Astronomy
Sub-Category: Spectroscopy
Observation Category: Solar System
Total Time Requested: 72 Hours

Proposal Title: Radio Frequency Observations of Cometary OH, CH, and H₂CO

ABSTRACT:

The nuclei of comets contain some of the most pristine material in the solar system. Radio frequency observations of molecules and ions in the cometary coma tell us much about the composition of the nucleus. We propose to observe CH and H₂CO in cometary comae. These organic materials are thought to arise from either trapped gas in nuclear ices, or daughter products of more complex organic molecules contained in the dust, or both. The abundance of H₂CO and CH relative to OH can be used to infer the oxidation state of the material, and constrain the nebular conditions in the giant planet formation region. We have successfully measured the OH 1667 MHz lines in several comets (Howell et al., 2001, Cordes et al., 1990), and will apply the same technique to measuring H₂CO and CH at 4.8 and 3.3 GHz, respectively.

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<tr>
<th>Name</th>
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I might want to do remote observing.

Instrument Setup

C

Atmospheric Optical Instruments:

Special Equipment or setup: We hope to use the S-high receiver for CH observations as soon as it is available. We will incorporate calibration measurements as part of this program, which can contribute to the testing of this receiver.

RFI Considerations

Frequency Ranges Planned

3.2-3.4 GHz
4.8 GHz
1665-1667 MHz

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