Technical Page

Proposal Type: Regular
General Category: Astronomy
Sub-Category: Spectroscopy
Observation Category: Extragalactic
Total Time Requested: 33 Hours

Proposal Title: Centimeter Wave Molecular Absorbers at Moderate Redshift

ABSTRACT:

We propose to search for 16 molecular transitions in three absorption systems at moderate redshift: PKS 1413+135 \((z = 0.247)\), B3 1504+377 \((z = 0.673)\), and B 0218+357 \((z = 0.685)\). We expect to detect absorption lines of formaldehyde \((\text{H}_2\text{CO})\), methanol \((\text{CH}_3\text{OH})\), OH, and CH, including several rungs of the rotational ladders of OH and CH. These molecules are roughly as abundant as other species already detected in the millimeter regime in the target systems. The proposed observations will provide the most precise tests to date of the claims of evolution in the fine structure constant, they will characterize the physical conditions and abundances of molecules with centimeter wave transitions in the neutral molecular interstellar medium of galaxies with lookback times of 2.9 and 6.2 Gyr, and they will pave the way for surveys for historically elusive molecular absorption systems.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<th>Phone</th>
<th>Student</th>
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<tbody>
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<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

S-low C

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations
Frequency Ranges Planned

1900-2000
2600-3000
3550-4000
4000-4450
4800-6000