

## Technical Page

This proposal has not been submitted before.

Proposal Type: Regular  
 General Category: Astronomy  
 Sub-Category: Spectroscopy  
 Observation Category: Extragalactic  
 Total Time Requested: 10.0 Hours  
 Minimum Useful Time: 2.5 hr

**Proposal Title:** Confirmation of an H<sub>2</sub>O absorption line in a high-redshift QSO

**ABSTRACT:**

In a 2003 Arecibo search for the 22.2-GHz H<sub>2</sub>O line towards 35 radio-loud objects in the redshift ranges 1.22–1.78 and 2.70–4.55, no detections of maser *emission* were made. However, an apparent narrow H<sub>2</sub>O *absorption* line was detected at the 4.5- $\sigma$  level in the QSO, B2209+152. This feature agrees with the published redshift of the object ( $z = 1.502$ ) to  $\sim 100$  kms<sup>-1</sup>. As this would be a unique detection of H<sub>2</sub>O (6<sub>1,6</sub>–5<sub>2,3</sub>) in absorption, we wish to reobserve the feature with a factor of two improvement in sensitivity in an attempt at confirmation. Using the WAPP spectrometer in 8-board mode, we would simultaneously observe 23-GHz transitions of ammonia (NH<sub>3</sub>) and hydroxyl (OH) as well.

Name	Institution	E-mail	Phone	Student
Tapasi Ghosh	Arecibo Observatory	tghosh@naic.edu	787 878 2612 Extn. 289	no

### Remote Observing Request

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

### Instrument Setup

X-band

### Atmospheric Observation Instruments:

**Special Equipment or setup:** none

### RFI Considerations

## Frequency Ranges Planned

8.6 - 9.6 GHz