Technical Page

This proposal has been submitted before.

The previous proposal number is 130903110313.

Proposal Type: Regular
General Category: Astronomy
Sub-Category: Continuum
Sub-Category: Radar
Observation Category: Lunar-EMP
Total Time Requested: 12 hours
Minimum Useful Time: 3 hours

Proposal Title: Arecibo ALFA Array observations to search for lunar meteoroid-strike EMPs

ABSTRACT:
ALFA array observations of the quarter-phase (waxing half-moon) at 1427MHz are proposed to search for possible ElectroMagnetic Pulses (EMPs) generated by gram-class meteoroid strikes on the Arecibo-visible lunar surface. The observing geometry and time of year are chosen such that moon transits near zenith at AO and at the end of the 1st quarter phase when the approximately half of the visible moon faces into the apex of Earth’s way thus maximizing the number meteoroid strikes. The EMPs are expected to be approximately in microseconds of duration and to occur several times per minute over the lunar surface. If detected, these EMPs would provide insight into the physics of solid-body hypervelocity impacts including how energy is partitioned among the ejecta, plasma, and radiative processes. A total of four observing periods are requested. Short periods of simultaneous radio observations using Haystack MISA antenna may also be attempted to verify timing and validate the EMPs detected.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saiveena Kesaraju</td>
<td>Radar Space Sciences Lab, Penn State University</td>
<td><a href="mailto:szk217@psu.edu">szk217@psu.edu</a></td>
<td>814-441-4349</td>
<td>G</td>
</tr>
</tbody>
</table>

Remote Observing Request

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

Instrument Setup
ALFA

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned