



December 8, 2017

Arecibo Call for Ionospheric Modification (HF facility) Proposals – 2018

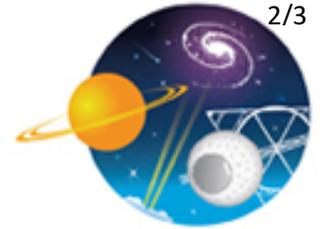
Dear Colleagues:

The Arecibo Observatory invites you to submit proposals for the use of the HF facility during 2018. HF experiments at Arecibo are scheduled by demand in periods of 5-7 days around new moon. Proposals should specify the associated diagnostics required: the incoherent scatter radar (ISR), active and passive optical instruments and others. Proposals should be submitted via online at <http://www.AreciboObservatory.org/hf-call>. Information about observing proposals and policies can be found at <http://www.AreciboObservatory.org/hf-policies.pdf>

Technical information about our facilities and instrumentation as well as the contacts for specific support are found below. For any further information not addressed in this communication, contact Eliana Nossa (enossa@naic.edu)

Best regards,

Eliana Nossa



1. Technical information.

1.1. HF facility.

The HF facility at Arecibo transmits a maximum of 600KW at 5.1MHz, with 22 dB of gain and 13 deg. of half power beam width, or 8.175MHz with almost 26dB and 8.5 deg. The HF transmission has a Cassegrain design where the primary is the 300 m Arecibo dish, the secondary is a sub-reflector mesh that reflects frequencies lower than 20MHz, and the feed system is composed of an array of three concentric cross dipole antennas at each frequency. The transmitters are connected to the antenna arrays by coaxial lines. Manual control of the power gain allows ramping up and down the individual antenna power in dB steps. Configurations using CW and pulses as short as few seconds are mostly used. The system supports linear, O and X modes.

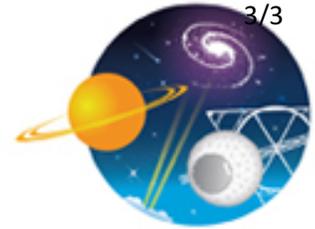
For further information, contact Eliana Nossa (enossa@naic.edu).

1.2. 430 MHz Incoherent Scatter Radar.

The 430 MHz Incoherent Scatter Radar (ISR) is capable of extremely sensitive diagnostics for HF experiments. It can run in parallel with the HF system, being one of the essential tools for diagnostics of the ionosphere modification over Arecibo. Raw data can be collected with a 25 MHz wide data taking system for later analysis while a narrower bandwidth system is used to provide online monitoring. The current coding technique allows 300 m range resolution on the enhanced plasma line while ion line and natural plasma line data are also recorded from the same radar pulses. For further information, contact Michael Sulzer (msulzer@naic.edu).

1.3. Active optical capability.

The "active" optical instruments (lidars) have the capability to monitor the upper stratosphere to lower thermosphere. The lidar beams are collocated with the ISR volume. We have three systems, two of which are configurable to observe one each of the meteoric metals: Na, Fe, Ca, or Ca+. Alternatively, one of the two metal lidars can be configured as a Rayleigh lidar to measure temperature from the upper stratosphere to the mesosphere, from about 35 to 70 km. The third lidar is a Doppler-resonance lidar that measures temperatures within the metal layer by sensing the Doppler broadening in the D1 resonance line of K.



Request for active optical instrument support for HF experiments must be included in the proposal. We encourage the PIs to contact our staff for particular optical configurations and further information. For lidar observations, contact Shikha Raizada (shikha@naic.edu), Jens Lautenbach (jlautenbach@naic.edu), or Jonathan Friedman (jonathan@naic.edu).

1.4. Passive optical instrumentation and Arecibo Observatory Remote Optical Facility (AO-ROF).

At Arecibo, we have a variety of airglow instrumentation. Presently, airglow sensing equipment includes an Ebert-Fastie Spectrometer (OH and O₂ bands); two Tilting-Filter Photometers (630.0 nm and 555.7 nm); three Fabry-Perot Interferometers (630.00 nm, 557.7 nm and 844.6 nm), and an All-sky Imager system (630.0 nm and 643.4 nm filters).

The AO-ROF is located on Culebra Island (18 18' 18"N; 65 18' 05"W), Puerto Rico, about 96 miles east of the Arecibo Observatory. The optical instruments at ROF can observe the same thermospheric volume over AO sampled by the Incoherent Scatter Radar (ISR). This capability is especially relevant during the HF campaigns. The ROF is designed to host two optical instruments requiring large domes (5-ft diameter) and four optical instruments that require smaller domes (1-ft diameter). Exterior space is also available for the installation of radio receivers or other kinds of instrumentation.

Presently, ROF hosts an all sky imager system (with filters to observe 630.0nm, 643.4nm and 557.7nm airglow emissions) and a High Frequency receiver. From September, 2017, an all sky imager system for OH bands will be available. Space can be provided for users to deploy instruments temporarily during the HF campaigns.

For further information, contact Pedrina Santos (pterra@naic.edu).

2. Ionospheric Prediction.

For every campaign, the SAS department will be providing the F2 peak parameters prediction to help the users to define the best way to conduct their experiments. These predictions will be accessible on our website at least a month before every campaign. The predictions will provide different scenarios depending on the solar activity, historical ionosonde, and ISR registers. For further information, contact Christiano Brum (cbrum@naic.edu).