The Arecibo HF Facility: status and the plan to maximize the new science on a constrained budget

Michael P. Sulzer*, Sixto A. González
Arecibo Observatory, Arecibo Puerto Rico, USA

The Arecibo heating facility, now under construction, was designed from the start to minimize the capital investment necessary to transmit a high power high frequency wave into the earth's ionosphere. The required large effective area of the antenna already exists: the Arecibo 300 m dish. A feed using dipoles and a sub-reflector is being constructed to illuminate the dish efficiently. The high power transmitters and transmission line have been obtained surplus. The components of the steel building to house the transmitters are on site, and the foundation is nearly complete.

In general, ground-based active experiments in aeronomy and space plasma physics require facilities that are moderate in price compared to some in situ experiments, but nonetheless, the costs are significant and increasing rapidly, especially from the effect of the recent increase of the cost of energy on the price of nearly everything needed for construction and operation. Given that construction budgets are fixed, or nearly so, it may be necessary to alter plans for construction and operation.

We have been able to identify some changes that can reduce expenses without affecting the primary goals of the project. There will be some loss in flexibility of operation and some restrictions on future modifications to the facility. We have simplified the switching system for the dipole arrays by using more and smaller transmission lines, possibly limiting future modifications to the facility using the highest frequency band of the transmitters. We will alter the biasing of the final transmitter stages, allowing more economical operation with a somewhat limited choice of waveforms.