

Polarization Measurements of an Unexpected ePOP-RRI Observation During an Arecibo HF Heating Campaign

Ashanthi Maxworth^{*(1)}, Glenn Hussey⁽¹⁾, Paul Bernhardt⁽²⁾,
Eliana Nossa⁽³⁾ and Fraser Hird⁽¹⁾

(1) University of Saskatchewan, Saskatchewan, Canada

(2) Naval Research Laboratory, Washington DC, USA

(3) Arecibo Observatory, Arecibo, Puerto Rico

In this work we present the polarization characteristics of an unexpected signal observed by the Radio Receiver Instrument (RRI) on the Enhanced Polar Outflow Probe (ePOP), which is on the CASSIOPE spacecraft. RRI consists of crossed orthogonal dipole antennas, which may operate as a polarimeter, and this was the configuration of RRI for the unexpected natural radio emission observed.

This unexpected signal was first observed during the July, 2017 Arecibo HF heating campaign. The unexpected signal increases in frequency with increasing altitude and occurs perpendicular to the geomagnetic field. We argue that this RRI observation was the electrostatic field created by the artificial field-aligned irregularities or striations generated by ionospheric heating.

Since the Arecibo Incoherent Scatter Radar was not operating during the July, 2017 experiment, we will be conducting a similar experiment in November, 2018, during an Arecibo HF heating campaign. Our objective is to verify whether or not the observed unexpected signal is the electrostatic field generated by artificial striations.