Results from First Campaign from Modulated Heating of the Ionosphere at using the New HF Heater at Arecibo Observatory

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The recently completed ionospheric heater at Arecibo Observatory is used for modulated HF (5 or 8 MHz) heating of the ionosphere, to generate ELF/VLF (3 Hz – 30 kHz) waves. Several days of transmissions were conducting during July 2017. ELF/VLF receivers were located at the observatory as well as on the east and west ends of the island of Puerto Rico. Observations made at the observatory show evidence of ramp and tone signals at frequencies from hundreds of Hz to several kHz. However, there is significant coupling of power line radiation to the transmitted frequencies in the observations making it unclear if the observed signals are generated in the ionosphere or from local power line radiation associated with the high power transmitter operation. Transmissions were conducted with 300 kW of radiated power, much less than similar experiments previously conducted at the HAARP and Tromso facilities and also a factor of two lower than experiments conducted with the original HF heating facility in Puerto Rico which was operational in the 1980s.