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Investigation of Ionospheric Radio Propagation Using Amateur Radio Data Sources JOSHUA KATZ, NATHANIEL FRISSELL, New Jersey Inst of Tech, ETHAN MILLER, Johns Hopkins Applied Physics Laboratory , MATTHEW COOPER, JOSHUA VEGA, MARY WEST, New Jersey Inst of Tech, CENTER FOR SOLAR TERRESTRIAL RESEARCH TEAM, JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY COLLABORATION — Amateur radio operators are hobbyists who routinely communicate using high frequency (HF, 3-30 MHz) radio links that travel over-the-horizon due to ionospheric refraction. These hobbyists have created global-scale systems that automatically monitor and log these communications to centralized database systems, thereby creating a large data set that can be mined for radio propagation, space weather, and space physics studies. In this data set there are interesting relations between the signal to noise ratios logged by the amateurs and the distances between the transmitters and receivers. These relations may be used to identify locations where the ionospheric waveguide has sufficiently refracted a radio signal back to Earth's surface. We show comparisons of the structures that appear in the amateur radio data set to existing ionospheric metrics and traditional sounding techniques.

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