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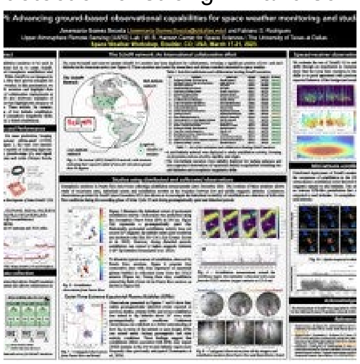
Poster
Ionospheric scintillation refers to rapid fluctuations in the phase and/or amplitude of radio signals as they propagate through plasma irregularities in the Earth's ionosphere. Scintillation can affect, for instance, the performance of systems that use transionospheric signals for remote sensing, communication, and navigation. Signals from Global Navigation Satellite Systems (GNSS) have been used by advanced receivers to monitor L-Band scintillation and ionospheric total electron content (TEC).
Rodrigues and Moraes (2019) showed that commercial off-the-shelf (COTS) GPS receivers could be combined with single-board computers (e.g., Raspberry Pi) to create low-cost ionospheric scintillation monitors (ScintPi 1.0). More recently, Gomez Socola and Rodrigues (2022) presented results of more advanced monitors (ScintPi 3.0) capable of making measurements of ionospheric scintillation and TEC using signals from multiple GNSS constellations.
While ScintPi monitors are not intended to fully replace more advanced commercial monitors, they have been shown to be adequate for many research investigations related to space weather and fundamental geospace science. In this presentation, we summarize the design of ScintPi monitors and highlight their benefits. We also present the status of collaborative deployments at low, middle, and high latitudes. Finally, we present examples of observations and results of collaborative studies that highlight the adequacy and benefits of ScintPi observations. These include for instance, magnetic conjugate observations of low latitude scintillation, spaced-receiver measurements of ionospheric irregularity drifts, and detection of strong L-Band scintillation by a receiver located in the US.

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