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Vertical total electron content (VTEC) has been a key measure used in ionospheric maps and models for decades. The primary measured input for VTEC has been GNSS (L-band: GHz) receiver data. While these receivers have been becoming more ubiquitous and cheaper recently, allowing for better ionospheric coverage over land, measurements of VTEC over oceans are still limited. While the precision of L-band VTEC measurements is extremely good (< 0.1 TECU), a key limitation of VTEC derived from L-band measurements has been the “leveling” factor, or how accurately the absolute VTEC is known (2-4 TECU). Previous work has shown that impulsive events measured in the Very-high-frequency (VHF: 30-300 MHz) regime can also be used to provide VTEC estimates without the leveling requirement. Comparisons between one year (2018) of VHF VTEC to L-band VTEC were able to constrain the absolute errors in JPL GIM and Open Madrigal Global GNSS VTEC values. An additional 4.5 years of VHF-derived VTEC measurements have recently been released (https://www.ngdc.noaa.gov/stp/space-weather/satellite-data/satellite-systems/lanl_vtec/). Using this years-long dataset, this work will study the variability in VTEC estimates between Open Madrigal and JPL GIM over time, location, and season.
Poster session day
Thursday, April 30, 2026
Poster location
24
Meeting homepage
2026 Space Weather Workshop
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