



Large Expanses of Kilometer-Scale Waves in the Low Latitude Ionosphere Observed by Electric Field and Plasma Density Probes on the C/NOFS Satellite

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The Vector Electric Field Investigation (VEFI) on the C/NOFS equatorial satellite provides detailed measurements of irregularities within the low latitude ionosphere. We present vector electric field and plasma density observations gathered on C/NOFS that reveal vast expanses of kilometer scales along the C/NOFS orbit. In many cases, these waves are observed for 1000's of kilometers along the satellite track and appear most prevalent in cases where the ionosphere F-peak has been elevated above the C/NOFS satellite perigee of 400 km. The vector electric field instrument on C/NOFS clearly shows that the electric field component of these waves is strongest in the zonal direction. The electric field components are strongly correlated with simultaneous observations of plasma density oscillations and appear both with, and without, evidence of larger-scale spread-F depletions. These km-scale, quasi-coherent waves strongly resemble the bottomside, sinusoidal irregularities reported in the Atmosphere Explorer satellite data set by Valladares et al. [JGR, 88, 8025, 1983]. Indeed, the observations show that such waves are a common feature in the low latitude ionosphere, particularly below the F-peak. We present detailed analyses of the wave measurements and show that such waves may be an important source of scintillations that has not been previously recognized in cases where they are not associated with "spread-F" plasma depletions.