

Comparing Equatorial Plasma Irregularities across Scale Sizes with GOLD and COSMIC

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Near the geomagnetic equator, large depleted plumes of plasma (whimsically referred to as “bubbles”) can form when bottomside ionospheric plasma is lifted up hundreds of kilometers, piercing through the ionospheric layer. This uplift is caused by a Rayleigh-Taylor instability in the bottomside ionosphere, which can grow over the course of several hours. These meso-scale structures (10s to 100s of km) can lead to the formation of fine-scale (10s to 100s of m) plasma irregularities in the vicinity of large plasma density gradients. These smaller scale structures are important because they are of the right scale size to interfere with GPS signals. This study will compare the formation times of the meso-scale bubbles from space-borne airglow images from GOLD with the fine-scale S4 measurements from the COSMIC spacecraft.

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