# Coordinated UV Imaging of Equatorial Plasma Bubbles Using Multiple Satellites

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Equatorial plasma bubbles have been studied through their manifestations as signal scintillation, spread-*F* in ionogram data, incoherent scatter radar observations, backscatter plumes in very high frequency (VHF) radar data, and depleted electron density structures in *in situ* rocket and satellite probe measurements. While equatorial plasma bubbles have been globally detected and locally imaged, space-based ultraviolet imagers now enable global imaging of plasma bubbles.

Ultraviolet imagers on spacecraft launched in 2001 and 2003 have provided several overlapping years of observations of the nightside ionosphere. Disk imaging from cross-track scans of low earth orbiting satellites allows for tomographic reconstruction of altitude vs. longitude bubble cross-sections from UV disk images. Two distinct orbits, one at an altitude of 625 km that precesses through all local solar times in just 60 days, and another at an altitude of 830 km in a fixed 8AM/8PM local solar time orbit allow for multiple views of an equatorial plasma bubble as it grows and drifts through the ionosphere. We have developed a technique for tomographic retrievals of electron density profiles from UV observations at 135.6 nm and adapted it to work with UV imagers in multiple orbital configurations.

Case studies of coincident and near-coincident plasma bubble images are presented. Validation of the reconstruction technique is provided by the consistent background electron density profile in overlapping images from both satellites, with retrieved values of both hmF2 and NmF2 in agreement. Electron density profile reconstructions are accompanied by discussion and analysis of plasma bubble drift rates and changes in the morphology and tilt of bubbles as they drift through the ionosphere.