

THE FORMOSAT-3/COSMIC RADIO OCCULTATION MISSION - RESULTS AND CHALLENGES

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The Constellation Observing System for Meteorology Ionosphere and Climate (COSMIC) / Formosa Satellite 3 (FORMOSAT-3) is the first six-satellite radio occultation mission that was successfully launched in mid-April, 2006. As of mid-July, 2007, this joint Taiwan-US mission has generated and distributed about 550,000 neutral atmospheric and 800,000 ionospheric profiles to 550 registered users. The main successes of the COSMIC mission up to this point include: operational assimilation of the data at some of the leading operational weather centers, NCEP, ECMWF and UKMO; reported positive impact on Hurricane prediction; penetration of ~90% of soundings to within 1 km of Earth's surface; demonstrated measurement precision of 0.2% in refractivity between 10-20 km altitude; detection of global atmospheric boundary layer; implementation of ionospheric scintillation detection with 50-Hz observations; and validation of TIE-GCM and GAIM ionospheric models. While the mission meets and even exceeds many per-launch expectations some goals have not yet been reached. Most notably we have not yet been able to provide 2500 profile / day. This presentation will summarize the highlights of the COSMIC mission but it will also discuss the challenges that we are facing, and what is presently done to overcome those and to further improve the science results and operational demonstration.