INVESTIGATION ON FORMOSAT-3 /COSMIC RETRIEVAL DATA QUALITY.

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The joint Taiwan/U.S mission, Formosat-3 /COSMIC (Constellation Observing System for Meteorology, Ionosphere, and Climate), consisting of six micro-satellites, was launched in April 2006. Its primary scientific goal is to obtain near-real-time radio occultation (RO) observations for assimilation into operational numerical weather prediction models. Researchers still work on the improvements of data retrievals, and more accurate results in earthŠs atmosphere and space weather can be expected.

GPS signal bends when it passes though the earth's atmosphere. From the signal delay, we can then calculate the temperature, pressure, and their changes with height and locations. GPS observations are stable and continuous, which makes them suitable for weather forecast and some further researches on atmospheric process and climate analysis. Current Formosat-3 data were processed by TACC in real-time processing and post-processing using the systems adapted from CDAAC. To support the upcoming GPS RO observation system, it is necessary to develop a reliable data processing system. The objective of this study was planned to be accomplished in several steps: Build up a mirror-site like TACC; Examine the data quality from the existing retrieved data and check out the error sources; Improve the NCURO method and apply the wave optics retrieval method to solve the multi-path effect which commonly occurs in tropical areas; Study the RO retrieved water vapor distribution quality and analyze the feasibility of improvement; Eliminate the spherical symmetry assumption in Abel Transform and minimize the errors in ionospheric observations; Simulate the RO conditions, "ray-trace" the radio waves in modeled ionosphere and observe the changes in phase and amplitude. We aim to analyze the error sources, assure the data quality and ultimately complete an independent RO data processing system.