Scientific Accomplishments of The COSMIC Mission After Ten Years In Orbit

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The atmospheric limb sounding technique, known as the GNSS radio occultation (RO) technique, that tracks the changes of radio signals transmitted by the Global Navigation Satellite Systems (GNSS) as they transverse the Earth's atmosphere has become a robust, powerful and relatively inexpensive all weather global observing system. The joint U.S.-Taiwan COSMIC/FORMOSAT-3 (Constellation Observing System for Meteorology, Ionosphere and Climate/Formosa Satellite #3) mission, a constellation of six microsatellite launched in 2006, is the world's first satellite constellation designed to take GPS radio occultation (RO) measurements in support of research and operation. After ten years in orbit, the COSMIC mission has produced more than 6.5 million RO sounding profiles, supporting more than 3000 registered users from 86 countries. The COSMIC mission has made a significant impact on operational weather prediction, climate research and ionospheric and space weather research. Stimulated by the success of the COSMIC mission, U.S. and Taiwan are developing a follow-on mission, known as COSMIC-2, which consists of 12 satellites in two tropical and polar constellations. The first tropical constellation of six satellites will be launched in 2018 and is expected to produce an even greater impact on numerical weather prediction, space weather, and climate than the COSMIC mission.