

The Growing Global Attention on the FORMOSAT-3 / COSMIC Constellation

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ABSTRACT

The Radio Occultation (RO) has been drawn great attention in the global atmospheric field since the successful “proof of the RO concept” program, GPSMET, in 1995. Shortly after the successful launch of the NSPO's FORMOSAT-3/COSMIC in April 2006, the enormous RO data in six-satellites constellation distribution globally have been successfully retrieved and used in the assimilation system widely. The FORMOSAT-3/COSMIC spacecraft constellation is the world’s first operational GPS radio occultation constellation mission. The COSMIC mission stands for Constellation Observing System for Meteorology, Ionosphere, and Climate and carries three onboard instruments including GPS Occultation Receiver (GOX), Tri-Band Beacon (TBB), and Tiny Ionospheric Photometer (TIP). All the six FORMOSAT-3/COSMIC satellites are maintained in the good state of health and are on their way toward the final constellation of six separate orbit planes with 30-degree separations as planned. Three out of six satellites have reached their final mission orbit of 800 km by the middle of February of 2007. The FORMOSAT-3/COSMIC has processed over 1800 good atmospheric sounding profiles (~900 mostly above the land mass) per day that has over the number of worldwide radiosondes launched from the ground stations or the total of the available RO data in discrete regions from other spacecrafts per day. It’s expected to reach 2500 good atmospheric sounding profiles per day in the near future. The initial results of the FORMOSAT-3 / COSMIC Constellation have shown a significant positive impact to the weather monitoring and forecasting systems. The ultimate success of a real-time operation of the FORMOSAT-3/COSMIC mission in the final constellation formation and the RO data application can be anticipated. This paper will address the growing global attention of the FORMOSAT-3 / COSMIC Constellation Program and the projection of the follow-on program(s) to continue the RO constellation in the future.