

## **Abstract**

With significant technological improvements on earth observation instruments, three dimensional space-borne remote sensing data became indispensable for modelling large areas and continents. To acquire high resolution 3D earth data, actual optical and synthetic aperture radar (SAR) satellite missions are launched frequently. Korean Multi-Purpose Satellite 3 (KOMPSAT-3), which was launched in May, 2012 by Korea Aerospace Research Institute (KARI), is a high-resolution optical observation mission. The 0.7 m ground sampling distance (GSD) and stereo imaging capability of the satellite enables to derive qualified digital surface models (DSM). We generated a 5 m spacing KOMPSAT-3 DSM in Istanbul historic peninsula and estimated its quality by comprehensively analysing the absolute and relative accuracies and the morphological detail description capability. In the analysis, 1 m spacing airborne laser scanning (ALS) DSM was used as reference. Additionally, the ALOS (Advanced Land Observation Satellite) World 3D 30 m (AW3D30) and Sentinel-1A (S-1A) DSMs have been used in comparison with the KOMPSAT-3 DSM. As accuracy metrics, standard deviation (SZ) and normalized median absolute deviation (NMAD) of height differences between KOMPSAT-3, AW3D30, S-1A and ALS reference DSM were used. The results demonstrated that KOMPSAT-3 DEM quality is better than AW3D30 and S-1A both in accuracy and morphologic detail analysis.

## **Keywords**

KOMPSAT-3 AW3D30 Sentinel-1A DSM quality