Digital Elevation Model Using Alos-Prism Stereo Pairs over Penang, Malaysia

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Abstract: Digital Elevation Models (DEMs) have been an important topic for decades. A DEM can be extracted automatically from stereo satellite images and efforts have been made to develop automatic extraction methods for height based on digital. In recent years, software packages have been developed by several companies to reconstruct the surface and automatically generate DEMs using suitable optical remote sensing data. In this study, ENVI 4.4 is used to build the Rational Polynomial Coefficient (RPC) model and to extract the elevation information from ALOS-PRISM Forward-Nadir stereoscopy imagery and Aft-Nadir stereoscopy imagery over Teluk Bahang, a hilly area at Penang Island. Quality accuracy assessment is being discussed based on visual approach, empirical approach and statistical approach with the reference DEM of ASTER GDEM. A ground true data also used to validate the generated data. GCPs and TPs were added in during the extraction process for a better accuracy output DEM. This generated DEM with 2.5m spatial resolution is then matched with the 90m spatial resolution of SRTM (Space Shuttle Radar Topography Mission) DEM to compare the result. Given the output result from Forward-Nadir stereo pair is better than the out result from Aft-Nadir stereo pair not only in visual aspect but also both statistical and empirical aspect.