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Orthorectification and Digital Elevation Model (DEM) Generation Using Cartosat-1 Satellite Stereo Pair in Himalayan Terrain

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ABSTRACT

High resolution data have high relief displacement in hilly terrains. Development of Digital Elevation model helps to assess bio resources more accurately in such terrains. While estimating bio resources in the Himalayan hilly terrain using multispectral LISS-III data of 23 m spatial resolution, the need for orthorectification of satellite data was necessary to correct for spatial distances due to high undulating slopes. Therefore, Cartosat stereo pair based Digital Elevation Model (DEM) was generated using the Rational Polynomial Coefficients (RPC) supplied along with the data products. By using the DEM orthorectification of LISS-III was created. In order to evaluate the positional accuracy of ortho rectified LISS-III Ground control points were selected using the Global Positioning System in differential GPS mode. As there is variation in the spatial distances and height over few points, the GCP corrected DEM was used for ortho rectification of Cartosat PAN and LISS-III data. This paper presents the procedure followed for ortho rectification and digital elevation model generation using Cartosat stereo pair data. The result of the study indicated high spatial resolution stereo images helped generation of three dimensional mountainous regions more accurately which helps in estimating the bio resources using multispectral LISS III data.

KEYWORDS

DEM, Cartosat, Stereo Pair, Orthorectification, Himalaya

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