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Validation of SRTM X Band DEM over Himalayan Mountain

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Abstract. The present research study assesses the accuracy of the SRTM X band DEM with respect to high accuracy photogrammetric Digital Elevation Model (DEM) for parts of the Himalaya. The high resolution DEM was generated for Manali and nearby areas using digital aerial photogrammetric survey data of 40 cm Ground Sampling Distance (GSD) captured through airborne ADS80 pushbroom camera for the first time in Indian Himalayan context. This high resolution DEM was evaluated with Differential Global Positioning System (DGPS) points for accuracy assessment. The ADS80-DEM gave root mean square error (RMSE) of $\sim < 1\text{m}$ and linear error of 1.60 m at 90 % confidence (LE 90) when compared with the DGPS points. The overall RMSE in vertical accuracy was 73.36 m while LE 90 was 75.20 m with regard to ADS80 DEM.

It is observed that the accuracy achieved for part of Himalayan region is far less as compared to the values officially claimed. Thus, SRTM X band DEM should be used with due care in mountainous regions of Himalaya.

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