Stereoscopic SAR Techniques for Generating Elevation Data over Caribbean Territories Using ENVISAT Imagery: A Case of Jamaica

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ABSTRACT

Tropical zones are affected by continual cloud cover making it challenging to apply many of the optical or laser-based techniques existing today for the generation of elevation data. The Caribbean is no exception. Elevation data is a fundamental layer for any Geospatial Information System (GIS) and critical for many spatial modelling activities; the geo-referencing of earth observation; and the visualisation of landscapes. The ENVISAT satellite with its microwave imaging characteristics, along with its cloud penetrating and day/night imaging capabilities makes it a compelling complementary tool for generating elevation data over these cloud affected territories. In this paper, we describe a stereoscopic Synthetic Aperture Radar (SAR) technique developed at the Institute of Engineering Surveying and Space Geodesy (IESSG), The University of Nottingham, for extracting elevation data from pairs of ENVISAT imagery over cloud affected Caribbean territories. Results are shown for a test site over the island of Jamaica and comparisons with 'ground truth' data are used to quantify the elevation data quality.

Keywords: Elevation data, stereoscopic SAR technique, ENVISAT imagery, Caribbean