

ANALYSIS OF DTM PRODUCTION FROM SPOT-5 HRS-STEREO DATA AND THE INFLUENCE OF ATMOSPHERIC EFFECTS

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The factors upon which the radiometric quality of satellite imagery depends are related on one side to the characteristics of the sensor system and on the other side the sun-sensor-surface geometries and imaging conditions. Atmospheric variations due to localized areas of haze close to the ground or thin, high cirrus clouds alter the image contrast and affect the interpretability of objects, thus reducing the information content.

The purpose of this work is to evaluate the radiometric quality of High Resolution Stereoscopic (HRS) data of SPOT-5 and analyze the influence of atmospheric effects in automatic DTM production by performing an accuracy assessment of the generated DTM.

The radiometric characteristics of the images are analyzed, the dynamic range and noise are quantified and the overall image quality is evaluated in order to enhance and optimize the images for further processing. The enhancement improves the definition of features, while in parallel a radiometric balancing is performed. The automatic DTM generation is performed on both original and radiometrically processed stereo imagery using ERDAS software. The assessment is done by comparing the height differences of the produced DTM with a reference DTM extracted from aerial imagery of larger scale, that describes an area of roughly 6 by 6 Km with a 25 m spacing and Z accuracy better than 1m RMS.

The HRS data used in the presented work were acquired over the area of Manosque in France, on the 14th August 2002 and were also used in the framework of the "HRS study Team" international test, supported by ISPRS -CNES. The area is characterized of a countryside landscape with crop fields and villages, with a combination of relative undulating and steep terrain. The height min and max heights are 100 and 1100 meters respectively.