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The following title was submitted:

A Unified Approach to Parametric Geocoding and Atmospheric/Topographic Correction
for Wide FOV Airborne Imagery
Part 1 : Parametric Ortho-Rectification Process

Abstract (239 words):

A method for the ortho-rectification of airborne remote sensing data has been refined in the last years on the basis of AVIRIS, DAIS, and Hymap hyperspectral imagery. The method describes the geometry of the data acquisition for each image pixel perfectly using DGPS flightpath information and high accuracy angular measurements. It is the core processor within the parametric geocoding application PARGE which was developed at the Remote Sensing Laboratories RSL.

The general accuracy requirements for all relevant geometric auxiliary data and the digital elevation models (DEM) are determined using error propagation analyses. The direct relation between input parameters and the image accuracy is shown and the crucial factors are determined. The results show that sub-pixel geometric accuracy can only be achieved by applying very stringent requirements to the geometric system of the sensor and the aircraft and by providing precise digital surface models.

For the further radiometric processing of the imagery, the geometric parameters have to be known per pixel. The respective outputs of the geometric correction program are defined based on the needs for atmospheric correction. Thus, the scan azimuth and zenith angles as well as the sensor-pixel distance are stored per image pixel in conjunction with the DEM. These parameters provide the basis for atmospheric correction as well as for BRDF processing algorithms of the geometrically processed hyperspectral imagery.

Results of the geometric processing will be shown for selected hyperspectral scenes and the achieved accuracies are discussed.