Notes on boresight calibration of hyperspectral data

Boresight calibration is done to provide accurate angle offsets between the internal measurement unit (IMU) and the sensor system. These small angle offsets could cause relatively large geometric errors when projected down to the earth surface, and thus the importance of accurate correction of these angles should not be underestimated.

Provider has specialized in boresight calibration of advanced aerial systems and provide highly accurate laser point clouds and images as a result. This experience lays the foundation for the boresight of hyperspectral image cubes. The boresight of hyperspectral data is done with help from already existing georeferenced orthoimages from our large up-to-date in-house database. If orthoimages are absent from this register, a highly accurate laser point cloud is used as source for ground control points (GCPs). The laser point cloud is captured simultaneously as the hyperspectral data, and hence leads to minimal temporal changes for accurate GCPs. Providers recommendation is that customer measures about 20 GCPs for each of the SWIR and VNIR datasets are gathered well-distributed in elevation and planar extent. This is done throughout the longest flight line with sufficient number of recognizable features to provide excellent boresight calibration of the hyperspectral data. Further, these angle corrections are applied to all the flight lines in the flight project. New boresight calibrations are done for each separate flight installation to provide up-to-date calibrations and to compensate for minor boresight changes between installations.

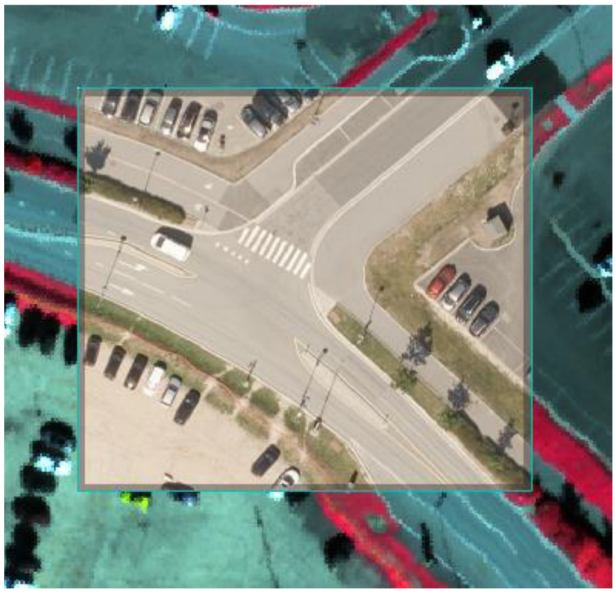

Figure: Orthorectified and georeferenced HySpex VNIR-1800 (CIR-composite) overlaid true-colour composite orthoimage.

Figure: Orthorectified and georeferenced HySpex SWIR-384 (RGB: 2152 nm, 1660 nm, 1223 nm) overlaid true-colour composite orthoimage