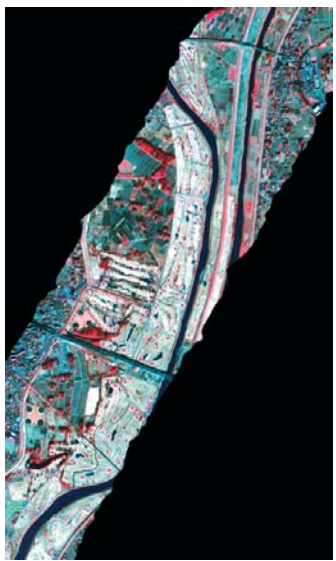


CALIGEO *software*

CaliGeo is an advanced software package designed to process raw AISA sensor data to a format that can be read into any modern data analysis package. There it can be analyzed using any of the latest data processing and analysis methods.



Processed AISA data

CaliGeo runs on a standard Windows or LINUX PC as a separate module under the ENVI software package by ITT Visual Information Solutions. CaliGeo is used to perform all radiometric corrections and to rectify and georeference AISA data while ENVI provides the tools for data analysis and interpretation. The processing sequence is illustrated on the reverse page.

RADIOMETRIC CORRECTIONS

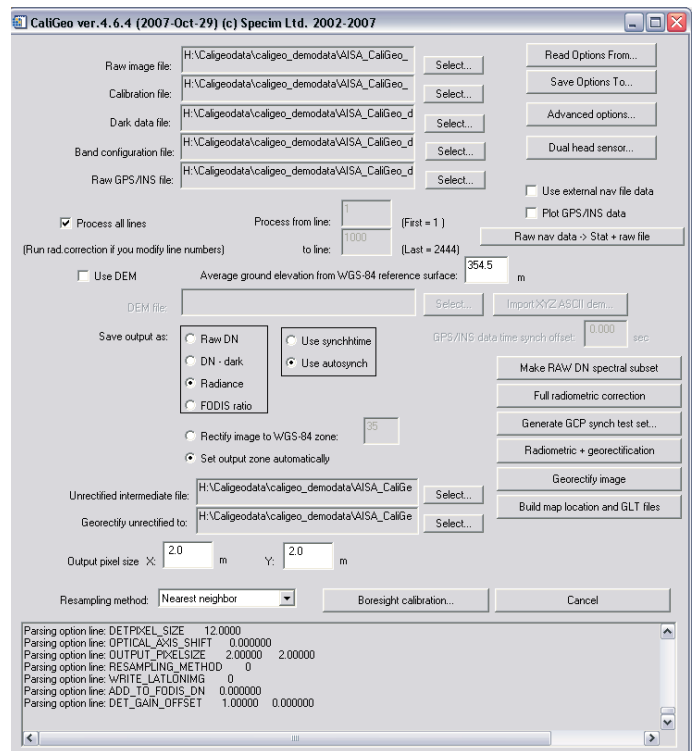
CaliGeo provides fast radiometric correction of the hyperspectral AISA data – including up to 500 spectral bands – using the radiometric calibration data provided by SPECIM with each AISA system. To perform a quick-look at the data, extraction of any spectral or spatial subset of the data is supported, as well as dark reference subtraction, and signal – to - FODIS ratio, which gives a rough estimate on the reflectance properties of the target.

GEORECTIFICATION AND GEOREFERENCING

CaliGeo performs georectification and georeferencing of the AISA data by using the position and attitude data collected automatically from the GPS/INS sensor synchronously with the hyperspectral AISA data. CaliGeo also processes the collected position and attitude data into a simple ascii –format readable with any text editor thus providing a quick way to check the validity of the navigation data.

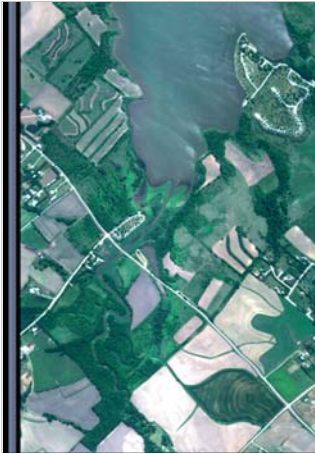
Currently, data from C-MIGITS III, Applanix POS/AV series, Oxford RT3000 series and Aerocontrol GPS/INS sensors is supported in CaliGeo, as well as import of external position and attitude data. CaliGeo also provides a fast tool to remove any inaccuracies in the final, georectified images caused by sensor vs. GPS/INS sensor misalignment, i.e. the boresight errors. Similarly, CaliGeo performs fast corrections for AisaDUAL data to match the ground pixels of the VNIR and SWIR images.

CaliGeo software, main window



PROCESSING SEQUENCE OF AISA SYSTEMS DATA

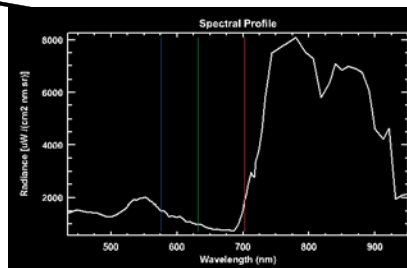
Step 1. Raw AisaEAGLE data. The stripe on the left margin is FODIS* data for monitoring the solar irradiance.



Step 2. Radiometrically corrected AisaEAGLE data.



Spectral profile



Step 3. Rectified and georeferenced AisaEAGLE data



Images courtesy of CALMIT, Center of Advanced Land and Management Information Technologies, University of Nebraska, Lincoln, NE, U.S.A.

Quick turn-around time from a raw, hyperspectral AISA data into a radiometrically corrected, georectified image allows the user to concentrate on the analysis of the data.

For data analysis and interpretation the ENVI software package combines a complete, advanced image processing and visualization package. The most advanced yet easy-to-use spectral tools are included. ENVI provides geometric correction, terrain analysis, radar analysis, raster and vector GIS capabilities, extensive support for images from a wide variety of sources, including AISA, and much more.

CaliGeo requires that either the ENVI runtime version or a full version of ENVI + IDL is installed on a computer. CaliGeo does not include any of the analysis features in ENVI or IDL.

FUTURE ENVI AND IDL UPGRADES AND CALIGEO VERSIONS AND SUPPORT

CaliGeo runs as a plug-in in the ENVI+IDL software environment. For every new version of ENVI, SPECIM will release a version of CaliGeo that is fully compatible with it. SPECIM will also provide the latest version of CaliGeo running under a limited set of older ENVI versions, depending on the interest in these versions.

Fast reply time for support is provided in any CaliGeo – processing related questions/problems for the customers under the Annual Support Contract.

Examples of the system features

- Option to perform full radiometric corrections to radiance or to reflectance-type FODIS ratio
- Extraction of any spectral or spatial subset of the data is supported
- Geometric correction and rectification eliminating any image distortion due to aircraft motion as well as providing output as a georeferenced hyperspectral image
- Fast removal of inaccuracies caused by sensor head vs. position/attitude device alignment
- Easy-to-use Dual sensor boresight correction to match the ground pixels of VNIR and SWIR sensors
- Support for use of external GPS/INS data
- Support for using ENVI – compatible DEM's for optimal georectification and georeferencing accuracy
- Easy-to-use graphical user interface
- Documentation provided for main IDL subroutine calls for user-developed data processing routines

*) FODIS is a Fiber Optic Downwelling Irradiance sensor manufactured by SPECIM. For more information please contact SPECIM