



Release Notes – MATCH-AT V5.1 *Pushbroom Triangulation*

May 2008

1

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New Feature: Support of Pushbroom – ADS40 Data

New Feature: Import of GPro Compatible Support Files (*.sup) and Orientation Definition Files (*.odf)

New Feature: Support of ADS40 Compatible Imagery

New Feature: Referencing the Original Trajectory Files from Applanix / IPAS

New Feature: Hardware Requirements for Stereo-Measurement

New Feature: Support for Standard Mouse and 3D Cursor in Photo Measurement

New Feature: Simplification of Measuring Additional Tie Points Manually

New Feature: Full Automatic Point Transfer in Point Measurement Tool

New Feature: Multiple Stereo Measurement Viewers for Point Measurement

Restrictions: Photo Measurement Tool PMT is limited to amount of image data

Restrictions: PMT time consumption loading image points

Restrictions: Currently only one camera per block is supported

Restrictions: Currently no automatic tie point matching available

Restrictions: Currently no graphical analysis available

Restrictions: Currently no generation of L1 stereo models available

Restrictions: Currently no automatic blunder detection available

Restrictions: Currently no graphical analysis available

Restrictions: Currently no automatic data organization available

Restrictions: Currently no automatic selection of adjustment mode available

Information: 64bit Operating System is highly recommended

MATCH-AT V5.1.1 *Pushbroom Triangulation*

New Feature: Support of Pushbroom – ADS40 Data

INPHO's photogrammetric software package supports now pushbroom sensor data of the ADS40 camera from Leica Geosystems. The image format levels 0 and 1 are fully supported and can be used in all applications for image processing and display. ApplicationsMaster allows the definition of projects. MATCH-AT Pushbroom enables the aerial triangulation for the ADS40 images. MATCH-T DSM can be used to automatically measure terrain or surface models which can be then checked and modified by DTMaster. Finally orthophotos can be generated with OrthoMaster. The sensor orientation data formats created by MATCH-AT Pushbroom are compatible with the ones created by GPRO.

MATCH-AT *Pushbroom* is a new triangulation module available within the well-known MATCH-AT environment. MATCH-AT is now available in different versions:

MATCH-AT for triangulation of frame imagery

MATCH-AT Pushbroom for triangulation of pushbroom imagery

MATCH-AT Box (sales unit consisting of MATCH-AT and MATCH-AT Pushbroom)

Each module is licensed separately.



Release Notes – MATCH-AT V5.1

Pushbroom Triangulation

May 2008 2

MATCH-AT Pushbroom is used to refine the exterior orientation of pushbroom imagery in order to use them for later stereo compilation, DTM/DSM generation or orthophoto production.

The triangulation computation works directly with the data downloaded with GPro (Leica) from the ADS sensor.

New Feature: Import of GPro Compatible Support Files (*.sup) and Orientation Definition Files (*.odf)

The Project Editor offers now an import and administration wizard for setting up projects for pushbroom data. Support files can be assigned using a batch import. All available file references (for instance to image files) are automatically extracted and added to the project file. Additionally, file path references included in support files can be modified using Project Editor functionalities.

New Feature: Support of ADS40 Compatible Imagery

The ADS40 meta and image files coming with the ADS40 images are fully supported, including the single overviews for each overview level.

New Feature: Referencing the Original Trajectory Files from Applanix / IPAS

The adjustment routines are referencing to the original trajectory files from Applanix or the IPAS system used with the ADS40 cameras. Corrections to the trajectory are computed and saved. I.e. computed corrections are available for all bands of a strip, even if the band was not referenced in the inpho project file.

New Feature: Hardware Requirements for Stereo-Measurement

The usage of the stereo measurement functions course stereo compatible hardware. Minimum requirement is a graphics board that supports OpenGL 1.5 or greater and that runs with DirectX 9.0 or greater. In those “minimum” cases the stereo display is using anaglyph stereo and users would need red-cyan or red-green anaglyph glasses. This mode will also work with standard LCD screens. For more sophisticated full color stereo, the software requires high-end OpenGL graphics boards that are able to run a sequential stereo display in a window. We recommend nVIDIA Quadro FX boards. Also to run the stereo mode, be sure to have a stereo monitor (CRT) running at recommended 120 Hz refresh rate. Standard LCD displays will work in anaglyph stereo mode only. For Stereo LCD displays, INPHO recommends the SD series stereo displays from planar (www.planar.com) in combination with NVIDIA Quadro FX graphics board.



Release Notes – MATCH-AT V5.1

Pushbroom Triangulation

May 2008

3

New Feature: Support for Standard Mouse and 3D Cursor in Photo Measurement

The stereo measurement viewers of the photo measurement tool support the usage of a standard mouse or of a 3D cursor. In general the standard mouse is sufficient for the point measurement, however optionally the “Immersion 3D cursor” or the “Immersion compatible Stealth Mouse”. Both require a serial port on the computer (USB is not yet supported by the Immersion drivers).

New Feature: Simplification of Measuring Additional Tie Points Manually

The new photo measurement tool makes it a lot easier to add additional tie points manually. Point IDs are automatically proposed in order not to cause conflicts with already existing point IDs. New tie points can be measured directly inside the block overview (patch mosaic) or the so-called TopoView (block overview with image stamps). The measurement mode “automatic” will automatically transfer the measurement into all overlapping images. The Multi-Aerial viewer or Multi-Stereo viewer will automatically show all required images.

New Feature: Full Automatic Point Transfer in Point Measurement Tool

In addition to the manual and semi-automatic measurement modes, now also an automatic LSM mode is available to measure ground control points or additional tie points. Selecting a location for the point inside either the block overview, the TopoView or in only one of the opened measurement windows will automatically transfer the points into all required images. A parameter can be specified to select the number of image pyramid levels (multi-resolution) to be used for the matching as the automatic LSM mode is an iterative process. Depending on the quality of the existing orientation parameters less or more pyramid levels need to be considered.

New Feature: Multiple Stereo Measurement Viewers for Point Measurement

The new photo measurement tool displays a point to be measured in a multi-stereo view. I.e. if a 6-fold point is to be measured in 6 images, the view will show 5 stereo windows simultaneously. The models are formed by using a selectable reference image with all possible combinations.

Restrictions: Photo Measurement Tool PMT is limited to amount of image data

PMT was tested to still have a suitable performance with a project flown with ~10 strips – assuming a maximum duration of 30 minutes per strip and 3 bands per strip (e.g. forward pan, nadir pan, backward pan).

Restrictions: PMT time consumption loading image points

Loading image measurements into PMT requires a considerable amount of time. About 100 measurements can be loaded in 2 minutes. Enhancing the performance is subject of changes to be carried out in future releases.

Restrictions: Currently only one camera per block is supported

Currently the user interface only allows to select one specific camera per block. Changing this is subject of changes to be carried out in future releases.

Restrictions: Currently no automatic tie point matching available

Currently no automatic matching of tie points is available. Adding this functionality is subject of changes to be carried out in future releases.

Restrictions: Currently no graphical analysis available

Currently no graphical analysis of adjustment results is available. Adding this functionality is subject of changes to be carried out in future releases.

Restrictions: Currently no generation of L1 stereo models available

Currently no generation of Level 1 stereo models is available. Inpho software can directly work with L0 imagery, however other software might require L1 rectified imagery. Match-AT Pushbroom stores results with GPro compatible *.sup and *.odf files, that might be used to generate L1 imagery elsewhere. Adding this functionality is subject of changes to be carried out in future releases.

Restrictions: Currently no automatic blunder detection available

Currently no automatic blunder detection is available. Check for blunders in the standardized residuals files and in the object misclosures. Adding this functionality is subject of changes to be carried out in future releases.

Restrictions: Currently no graphical analysis available

Currently no graphical analysis of adjustment results is available. Adding this functionality is subject of changes to be carried out in future releases.

Restrictions: Currently no automatic data organization available

Currently no guided automatic data organization is available. The plan is to automatically search drives or the network for known file structures identifying an ADS flight. Adding this functionality is subject of changes to be carried out in future releases.



Release Notes – MATCH-AT V5.1

Pushbroom Triangulation

May 2008

5

Restrictions: Currently no automatic selection of adjustment mode available

Currently no automatic selection of the appropriate adjustment mode is available. It is planned to select the mode automatically according to the available measurements and control points. Adding this functionality is subject of changes to be carried out in future releases.

Information: 64bit Operating System is highly recommended

As pushbroom data handling is very demanding on computation power, it is highly recommended to operate the 64bit software version on a 64bit operating system such as Windows Server 2008, XP 64 or Vista 64. To get an idea about memory consumption:

A project with 10 flight lines (about 30 minutes long, which is typically the maximum length = about 300000 pixels long and 12000 pixels wide) with forward view, nadir view and backward view would require approximately 10Gbyte RAM to be loaded into the photo measurement tool.

Should you have any questions regarding the technical details of software, please contact your Support Team at support@inpho.de.