Subject: Free SAR Geocoding Software
Posted by Andy Sowter on Tue, 18 Apr 2000 07:00:00 GMT
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Free SAR geocoding software, Ellipse 1.1, is available via the following website:

http://www.synopticsga.freeserve.co.uk/geocode/ellipse.htm

The reason for free distribution to the public follows trials held within sister companies and the Joint Research Centre, Italy and the agreement that there is a need to promote a more automated approach to spaceborne SAR Geocoding. SAR is unique in that automated geocoding is possible, unlike, for example, most optical sensors.

This release has not been funded in any way and is, therefore, a little rough around the edges! However, it works. If it stimulates enough interest, there may be further releases (perhaps even terrain correction).

Technical Overview

This software allows the automated ellipsoid correction of an ERS SAR PRI image using a full range doppler solution. Such a solution is more accurate than warping using corner coordinates and is fully automated. The results should be within 25m (2 pixels) of error.

The software will select the UTM Zone dictated by the centre coordinates of the image and will output a 16-bit integer array at 12.5m pixel spacing in those coordinates, using the WGS-84 ellipsoid as reference. The resampling method used is Nearest Neighbour.

The Software

The software is provided as an IDL executable (.SAV) and was developed under IDL 5.2. Information about IDL may be found at:

http://www.rsinc.com

The software is installed using the RESTORE function and executed by the single command

go_ellipse

at the IDL command line

It is based on some in-house terrain correction software and has not been

optimised for speed. Furthermore, it reads the whole PRI image into memory (some 130MB).

On a P450, 256MB RAM, it takes about 2 hours to complete a full scene.

The output files are as follows:

- A text file containing a dump of the PRI image header.
- A generic binary data file containing the geocoded image in 16-bit integer format.

Assumptions

The input file is assumed to be fully compliant with the ESA CEOS Harmonised format described in:

"ERS SAR.PRI CCT and EXABYTE", European Space Agency document: ER-IS-EPO-GS-5902.4, Issue: 2.1, Date: October 2, 1995, Prepared by: Ola Grabek, Checked by: H Laur.

Any deviation from this format (such as a variable length Platform Position Data Record, which is common outside of Europe) will result in errors. The author is confident that the software will work using PRI data output by any of the ESA Processing and Archiving Facilities in Europe.

The Author

Andy Sowter has been designing SAR ortho-rectification requirements since 1988 and has been pioneering tiepoint-free methods for spaceborne SAR sensors, such as ERS and Radarsat. Recently, he has designed and implemented a method for generating DEMs from Radarsat stereo pairs without ground control.

Andy does NOT describe himself as a programmer!!

Further information may be found at:

http://www.synopticsga.freeserve.co.uk