

SPIRIT Product:

DTMs / Over Polar Regions

CONTEXT:

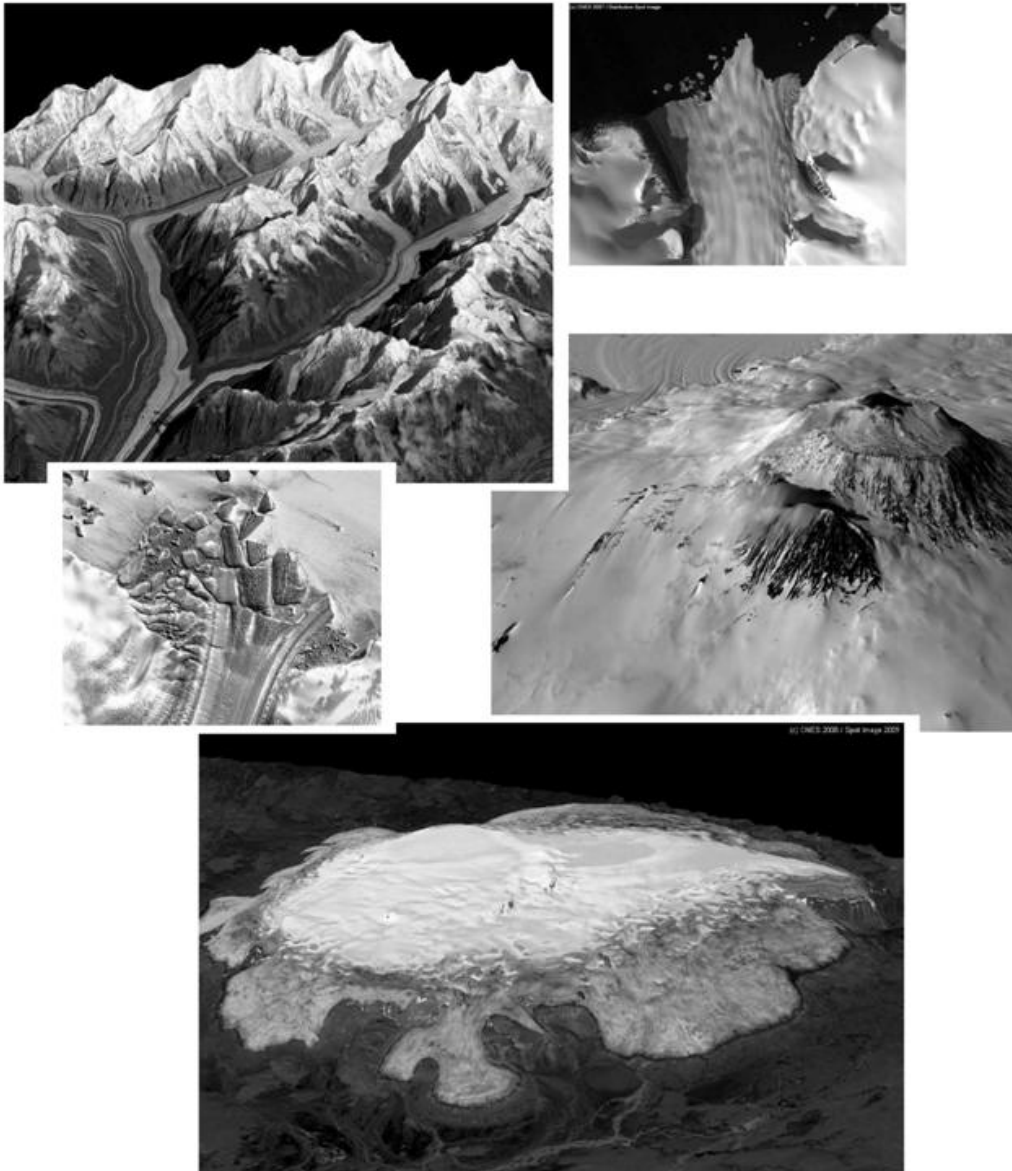
The **SPIRIT project** : (**SPOT 5 stereoscopic survey of Polar Ice: Reference Images and Topographies**)

was launched in 2007 by the French Space Agency (CNES) and Spot Image in the framework of the 4th International Polar Year (IPY), in collaboration with the Research Laboratory in Spatial Geophysics and Oceanography (LEGOS-CNRS) and the French National Geographic Institute (IGN).

The International Polar Year ended in early 2009, but it's still possible to obtain SPIRIT DEM already produced during the International Polar Year.

Or even order

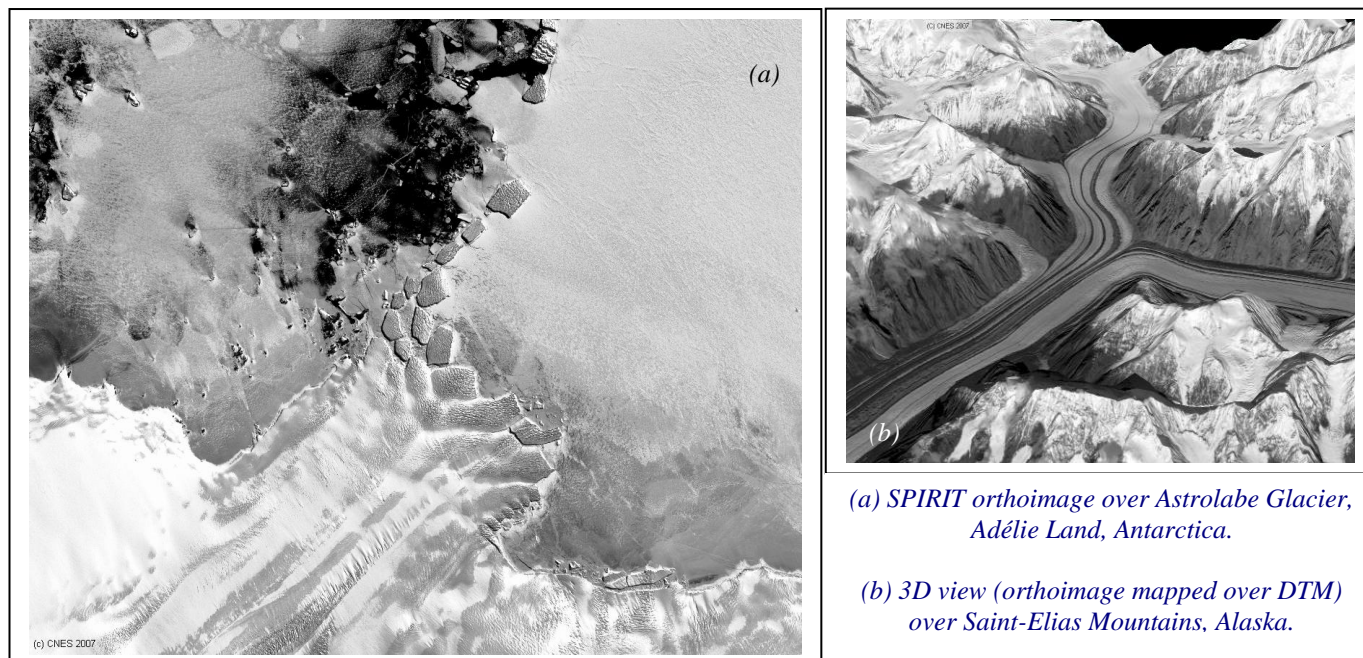
The production of a SPIRIT DEM on your area of interest from available stereoscopic pairs. The available stereo coverage can be browsed through the Polar Dali Database.



3D Glaciers, Ice Caps and Ice Streams

The SPIRIT product is a chance for the Scientific Community to improve its knowledge of the topography and the dynamics of glaciers, ice caps and ice streams in the Polar Regions.

The SPIRIT product is derived from large footprint (120 km swath; maximum length of 600 km) SPOT 5 HRS stereoscopic pairs. It is composed of 2 DTMs, 2 reliability masks and one orthoimage. Assuming good accuracy and consistency with other sources, the SPIRIT product can be used alone or by fusion, merging or comparison with other data, like ICESat profiles. Main applications are mapping elevation changes, measuring velocity field, following calving front and margins evolutions, etc.



(a) SPIRIT orthoimage over Astrolabe Glacier, Adélie Land, Antarctica.

(b) 3D view (orthoimage mapped over DTM) over Saint-Elias Mountains, Alaska.

Description

This product is composed of:

- 2 different DTMs, assuming different sets of correlation parameters to fit with gentle (V1) or steep (V2) slopes.
- 2 reliability masks, to determine the calculated (correlated) or interpolated elevation values.
- 1 HRS orthoimage.
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■ DTM Characteristics

- Resolution / Projection: 40 m / UTM or 40 m / polar stereographic or geographical, to be defined by the user in the Order Form.
- DTM “no void”: the non correlated pixels are interpolated. The SPIRIT DTMs does not include any “no data” value.
- DIMAP Geotiff format.
- Absolute horizontal precision: 30 m RMS (as evaluated by IGN/CNES in 2006 and earlier)

■ Mask Specificities

- Raster masks, showing correlation score (from 0 to 100 %).
- Interpolated pixels reported with 0 %, 104% or 108% score.
- Point-to-point superimposable with the corresponding DTM.
- Geotiff format, same projection as the corresponding DTM.

■ HRS Orthoimage

An orthoimage is provided assuming the followings properties:

- Orthoimage computed from one of the HRS images, calculated with one of the two DTMs
- 5 m resolution (or approx.)
- Geotiff format
- Absolute horizontal precision: 30 m RMS (as evaluated by IGN/CNES in 2006 and earlier)

The SPIRIT DTMs result of a predefined processing method, including no manual intervention. Therefore, the accuracy of the SPIRIT Product layers is not warranted. However, the absolute precision can be improved by using Ground Control Points (GPS measurements) provided by the user (please refer to the Order Form).

To cope with the specific needs and conditions over Polar Regions, (glacier motion, surface state changes), the SPIRIT product is derived from a single stereoscopic pair (no mosaicking assumed).

HRS stereoscopic pair is not delivered. SPIRIT products are only available for stereoscopic pairs published in the Polar DALI database.

Accessing the polar HRS database



Regions of interest in Greenland, Antarctica, Alaska, Iceland, etc. (up to 81° North/South in latitude) have been chosen according to the Scientific Community expectations with the scientific support of the CNRS-LEGOS. All the corresponding stereoscopic pairs collected by SPOT 5 can be checked and browsed through a dedicated interface: Polar DALI.

How to get SPIRIT Products?

Polar DALI, a web application allowing you to browse and select HRS images on your area of interest <http://polardali.spotimage.fr:8092/IPY/dalishsearch.aspx>

1. **Ask for a login:** provided by request at: hres_polar@spotimage.com, for a laboratory application matching the CNES International Polar Year project criteria.
2. **Browse the Polar DALI HRS pairs archive**, according to
 - Cloud coverage ratio
 - Area of interest (Google Earth KML Polygon, WKT ROI or ISO19107 Polygon)
 - Acquisition date
3. **Fill the Order Form**, directly downloadable from Polar DALI.
4. A Spot Image **acknowledgement of receipt** informs you once the order form is accepted.
5. The SPIRIT product is delivered through a **FTP server**.

The screenshot shows the Polar DALI web application interface. It includes a search bar for 'Access ID', filters for 'Acquisition Date', 'Region of Interest', 'Max Cloud Cover Percentage', and 'Min Quality Rating'. Below the filters, there is a 'Search' button and a table of results. The table has columns for 'Access ID', 'Acquisition Date', 'Region of Interest', 'Max Cloud Cover Percentage', and 'Min Quality Rating'. The first row shows an Access ID of 'PFL15009_2' and a search result for 'PFL15009_2' with a cloud cover of 100% and a quality rating of 'Excellent'.

For further inquiries, please contact: <http://www.isis-cnes.fr> or hres_polar@spotimage.com