IRS-P5 Cartosat-1
Stereo Pairs and the generation of DEM

Bertrand Saint-Guilhem
Who we are, how we are linked

- 13 employees
- 100% subsidiary of GAF AG
- data reception, standard processing & image interpretation
- 12 years experience in data distribution.

- 140 employees
- more than 20 years experience in remote sensing, software development and project management world wide
- ortho processing, mosaicing, enhancement.

- is GAF’s sole shareholder.
Neustrelitz Ground Station

Located at the German Aerospace Center (DLR) in Neustrelitz

Operated by Euromap and DLR staff
Indian Earth Observation Program

1C PAN 5.8m; LISS-III 23/70m, 4 bands; WiFS 188 m, 2 bands
P3 MOS-A/B/C; WiFS 188m, 3 bands
1D PAN 5.8m; LISS-III 23/70m, 4 bands; WiFS 188 m, 2 bands
P4 OceanSat-1 OCM 300 m, 8 bands; MSMR
TES PAN high res.
P6 ResourceSat-1 LISS-IV 5.8m, 3 bands; LISS-III 23m, 4 bands; AWIFS 56 m, 4 bands
P5 CartoSat-1 PAN 2.5m, in-flight stereo 27.5 km swath; monoscopic 55 km swath, 10 bit
CartoSat-2 PAN <1m, pointable, 9.6 km swath, 10 bit
CartoSat-2A PAN <1m, pointable, 9.6 km swath, 10 bit
P7 OceanSat-2 Ku-Scatterometer, Ku-Altimeter, MW-Radiometer, TIR
ResourceSat-2 same as IRS-P6 more bits
RISAT-1 Multi-Freq. SAR, 50m/240km
3-6m/30km, 1-3m/10km
Megha-Tropiques tropical meteorological processes
RISAT-2
ResourceSat-3
Hyperspectral Imager
OceanSat-3
Hi Res Leo 0.2m
Data Acquisition Strategy

- IRS-P5 Cartosat-1 Stereo
  Altitude: 618 km

- IRS-P6 Resourcesat-1
  Altitude: 817 km

Nadir Acquisition
Collection of contiguous coverages
1- IRS Cartosat-1 Stereo Pairs

2- IRS-P6 Resourcesat-1
In Flight Stereo

Two cameras: PAN-Fore & PAN-Aft
+26° and -5° tilt along the track
Nominal B/H ratio 0.62

Swath 27.5 km
10 bit resolution
Spatial resolution 2.5 m
Algier
IRS-P5  PAN-Aft
2.5 m / 10 bit / 27 km / PAN
Cartosat-1 over Frankfurt

PAN-Aft acquired on 1. April 2009
Poland: IRS-P5 Stereo Coverage - Cloudfree

Layer Stacking:
- [cc] = 0
  10-Nov-07 - 26-May-09
- 0 < [cc] <= 10
  10-Nov-07 - 26-May-09

Data considered until:
26-May-2009

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Middle East: IRS-P5 Stereo Coverage - Cloudfree

Layer Stacking:
- \([cc] = 0\)
  - 10-Nov-07 - 06-Mar-09
- \(0 < [cc] \leq 10\)
  - 10-Nov-07 - 06-Mar-09
- \([cc] = 0\)
  - 12-May-05 - 12-Feb-09
- \([cc] = 0\)
  - 03-May-07 - 01-Sep-08

Data considered until:
- 06-Mar-2009

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Cartosat-1 over Kiev

20. August 2008

PAN-Aft
Digital Elevation Models

One stereopair:
- PAN-Fore
- PAN-Aft

Derived products:
- Scene-based DEM
- Orthoimage
- 3D visualization
Algier - Extracted DEM
3D Terrain Visualization

2.5 m ortho image draped over Cartosat-1 DEM
Specifications of the DEMs

Fulfilment of mapping tasks up to 1:12.500 scale

- DEM post spacing: 10 m
- Spatial reference system: UTM / WGS84
- Height reference: EGM96
- DEM file format: GeoTIFF (16 bit)
- Orthoimage pixel size: 2.5 m

We will meet specifications of DTED Level 3 with positional accuracy: 10 m CE90 horizontal 10 m LE90 vertical

More details about different levels on request.
Digital Elevation Models

Cartosat-1 DEM, 10 m

SRTM-C DEM, 90 m
Euro-Maps 3D

We will market our DEMs under the name Euro-Maps 3D.

Euro-Maps 3D will be available on scene or km² basis.

Our mosaicked DEMs will be delivered as 0.5° x 0.5° tiles.
1- IRS-P5 Cartosat-1 Stereo

2- IRS-P6 Resourcesat-1
IRS-P6 Resourcesat-1

AWiFS: 60 m / 4 bands / 740 km

LISS-III: 20 m / 4 bands / 140 km

LISS-IV Mono: 5 m / 1 band / 70 km

LISS-IV Merge: 5 m / 3 bands / 70 km
## IRS-P6 Resourcesat-1 Fact Sheet

<table>
<thead>
<tr>
<th>Sensor</th>
<th>LISS-IV</th>
<th>LISS-III</th>
<th>AWiFS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode</strong></td>
<td>Mono</td>
<td>MX</td>
<td></td>
</tr>
<tr>
<td><strong>Spatial resolution</strong></td>
<td>B2 B3</td>
<td>green</td>
<td>5.8 m</td>
</tr>
<tr>
<td></td>
<td>B4 B5</td>
<td>red</td>
<td>5.8 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIR</td>
<td>5.8 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SWIR</td>
<td>5.8 m</td>
</tr>
<tr>
<td><strong>Swath-width</strong></td>
<td>70 km</td>
<td>23.9 km</td>
<td>140 km</td>
</tr>
<tr>
<td><strong>Radiometric Resolution, Quantisation</strong></td>
<td>all Bands</td>
<td>7 bit</td>
<td>7 bit</td>
</tr>
<tr>
<td><strong>Spectral coverage</strong></td>
<td>B2 B3</td>
<td>green</td>
<td>520-590 nm</td>
</tr>
<tr>
<td></td>
<td>B4 B5</td>
<td>red</td>
<td>520-590 nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIR</td>
<td>620-680 nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SWIR</td>
<td>770-860 nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1550-1700 nm</td>
</tr>
<tr>
<td><strong>CCD arrays</strong> (number of arrays * No. of elements)</td>
<td>B2 B3</td>
<td>green</td>
<td>1 * 12000</td>
</tr>
<tr>
<td></td>
<td>B4 B5</td>
<td>red</td>
<td>1 * 12000</td>
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<tr>
<td></td>
<td></td>
<td>NIR</td>
<td>1 * 6000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SWIR</td>
<td>1 * 6000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 * 6000</td>
</tr>
</tbody>
</table>
AWiFS – 23 February 2009

370 km

370 km
South Africa
IRS-P6 AWiFS
60 m / 10 bit / 740 km / 4 bands
Italy
IRS-P6 AWiFS + synthetic blue
60 m / 10 bit / 740 km / 4 bands
Full coverage of Turkey in 2006

LISS-III
Nadir acquisitions
Euro-Maps Ortho-Mosaics

5 m resolution (up to 1:25,000)
Natural colour, balanced and enhanced
Ortho-corrected, bundle adjusted
10-15 m CE90 horizontal accuracy
Euro-Maps Ortho-Mosaics

Available for immediate delivery:

- Germany
- Switzerland
- Austria
- Italy
- Spain
- Portugal
- Poland
Lisbon
IRS-P6 LISS-IV Mono + LISS-III
5.8 m / 8 bit / Natural Colour rendition
new merge product: 2.5 m natural colour

produced by merging Cartosat-1 PAN-Aft data and IRS-P6 Resourcesat-1 LISS-III data.
Stuttgart
Cartosat-1 + Resourcesat-1
PAN-A + LISS-III
January + September
Rome Fiumicino
Cartosat-1 + Resourcesat-1
PAN-A + LISS-III
Thank you for your attention

www.euromap.de