

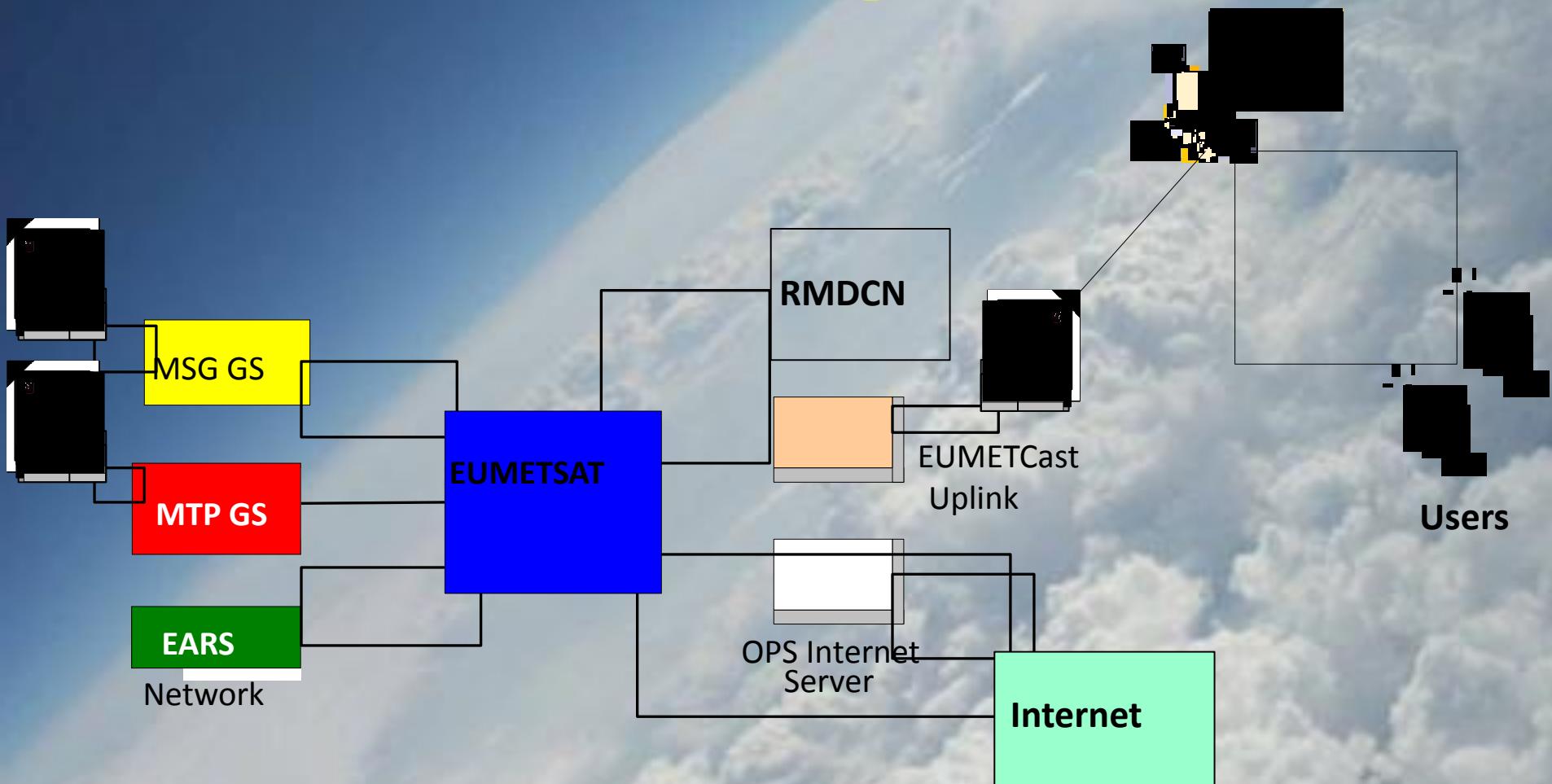
Processing of MSG Data

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Tver' July 2014

Outline

- Installation
 - requirements
 - data management
- Software
 - Imaging (Visualization)
 - Processing

EUMETCast System



*EUMETCast - EUMETSAT's Broadcast System
for Environmental Data*

Necessary components to obtain data from EUMETCast system



What kind of data is available for meteorological service as Free from EUMSTCast

- Monitoring of atmosphere each 15 minutes
- Raw data from 12 channels radiometer – SEVIRI (Spinning Enhanced Visible and Infrared Imager)
- Data from other satellites (NOAA, METOP, GOES)

Channels and PID

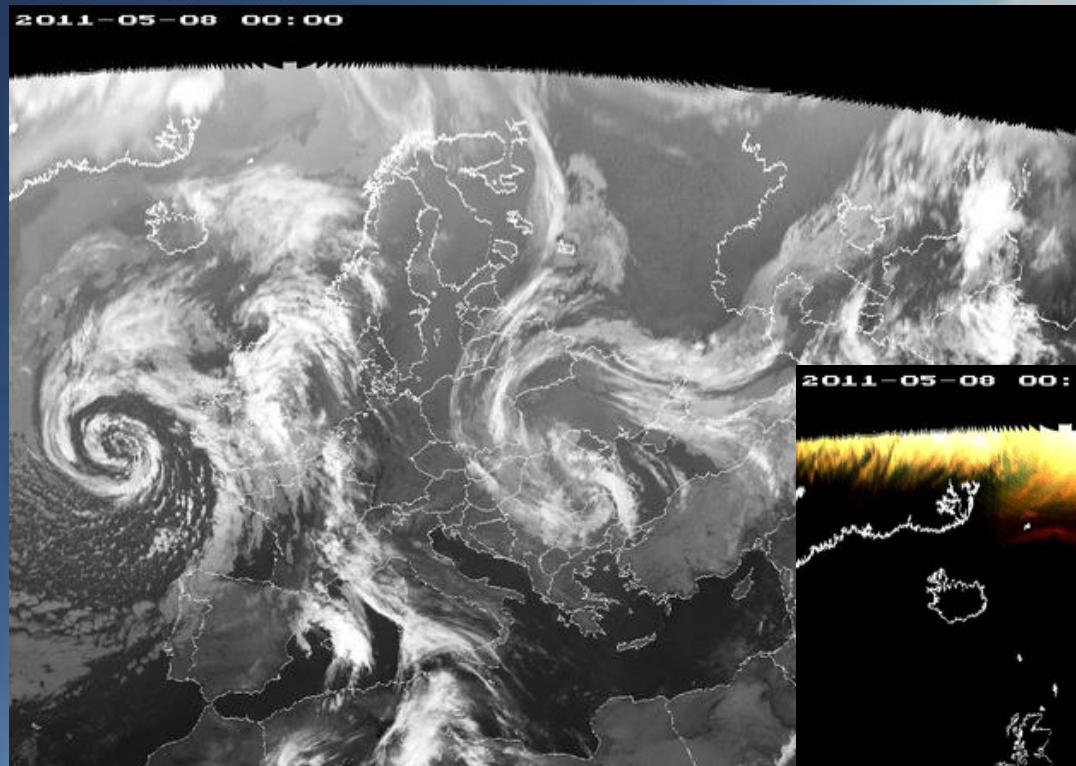
Channel name	PID	Remark
TSL Announcement Channel	100	Announcement channel
EUMETSAT Data Channel 2, 8, 10, 11, SAF-Global, DEVCOCAST-1, EPS-Global	300	Primary High Rate SEVIRI, Multi-service Europe, Jason data, CMA data, DevCoCast products, EPS Global data
EUMETSAT Data Channel 3, 9, 12, TPC-1,	301	Multi-service Europe, DCP data, Multi-service Europe 2, SAF Europe, FP-7 products

Characteristic of SEVIRI channels

MSG satellite

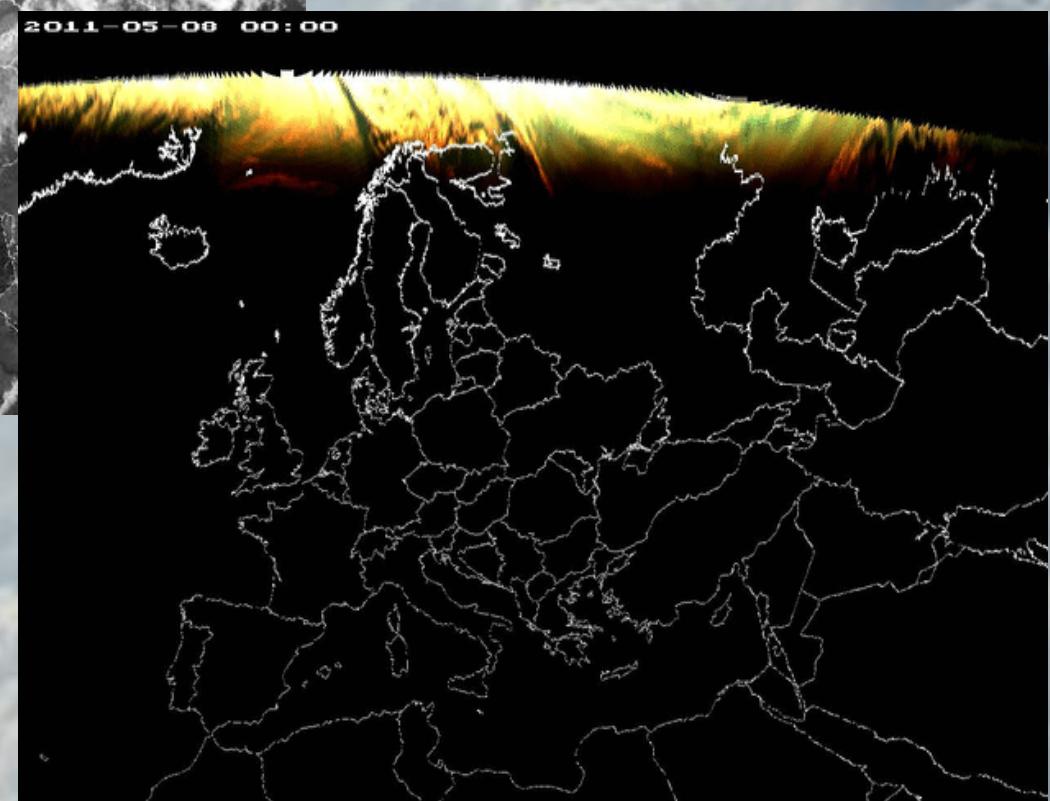
SEVIRI CHANNELS			
		Properties	
Channel	Cloud	Gases	Application
HRV 0.7	Scattering Emissivity Absorption	0	Broad band VIS Surface, aerosol, cloud detail (1 km)
VIS 0.6		Narrow band	Ice or snow
VIS 0.8		Narrow band	Vegetation
NIR 1.6		Window	Aerosols, snow<>cloud
IR 3.8		Triple window	SST, fog<> surface, ice cloud
WV 6.2		Water vapour	Upper troposphere 300 Hpa humidity
WV 7.3		Water vapour	Mid-troposphere 600 Hpa humidity
IR 8.7		Almost window	Water vapour in boundary layer, ice<>liquid
IR 9.7		Ozone	Stratospheric winds
IR 10.8		Split window	CTH, cloud analysis, PW
IR 12.0		Split window	Land and SST
IR 13.4		Carbon dioxide	+10.8: Semitransparent-cloud top , air mass analysis

2011-05-08 00:00



IR Channel

2011-05-08 00:00



VIS Channel

A photograph of a majestic mountain range. In the foreground, a large, light-colored mountain peak rises, its slopes covered with patches of green vegetation and rocky terrain. The sky above is a clear, vibrant blue, providing a stark contrast to the earthy tones of the mountain. The lighting suggests a bright, sunny day.

Data processing

Processing methods and algorithms.

- MSG software: XRIT2PIC

http://www.alblas.demon.nl/wsat/software/lisoft_msq.html

- Reads content of directory containing MSG received files and

- generates a clickable tree structure

- Preview of single and composed pictures; includes zooming/panning

- Generation picture files in some standard format:

- PGM (both 1 byte and 2 bytes per pixel)

- PPM

- JPEG

- AVI movie

- Overlay of coast/country boundaries

- Combining 2 or more channels into composite (colour) pictures

- 2 ways to generate movies:

- Built-in AVI generator

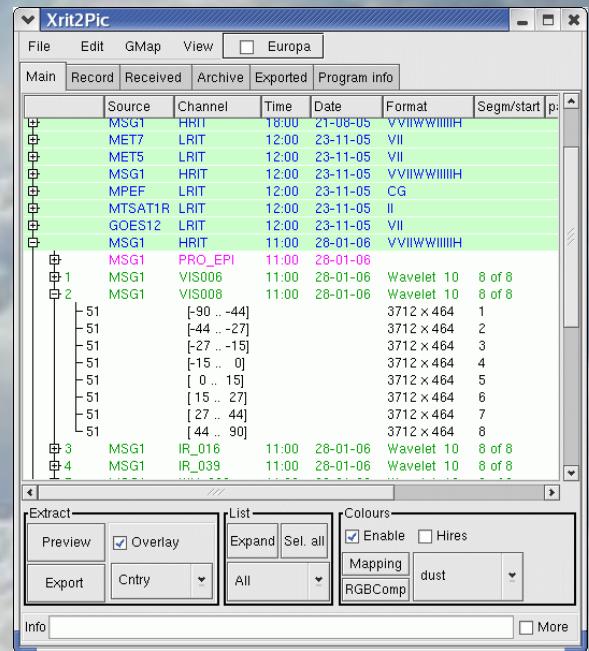
- Interfaces with external movie generator, e.g. 'mencoder'

- All dataprocessing done using the original received data

- Non-gui mode for background translations

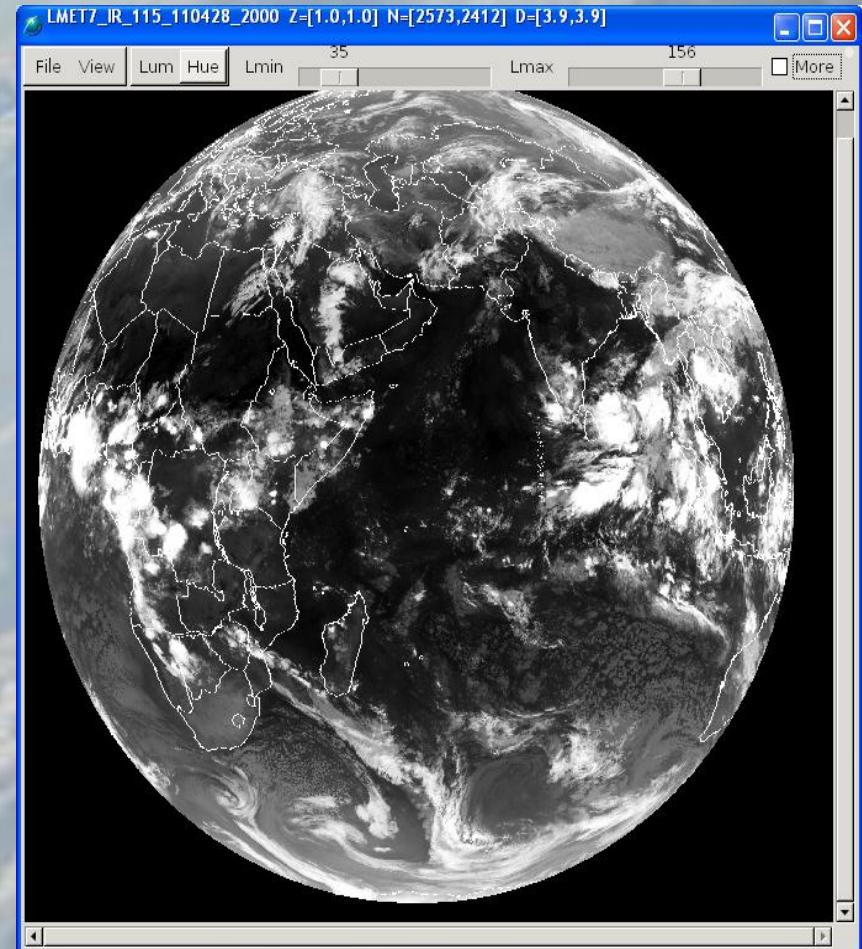
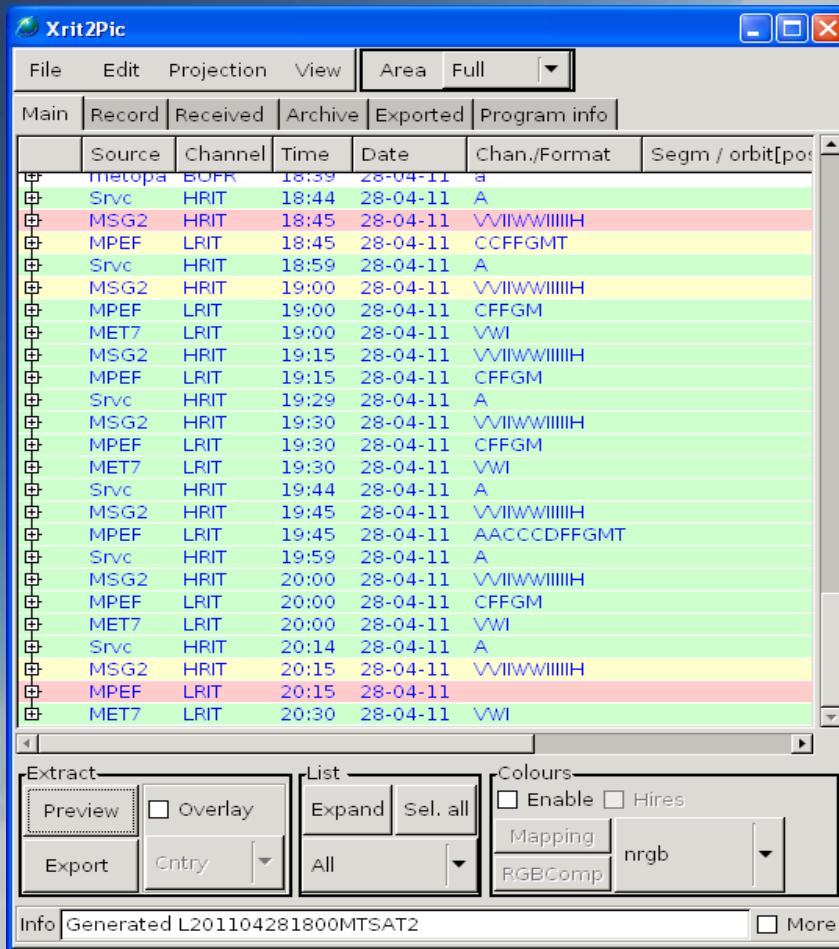
- OS: Linux and Windows; on request also Sun/Solaris

- Full source code available to compile for e.g. Mac

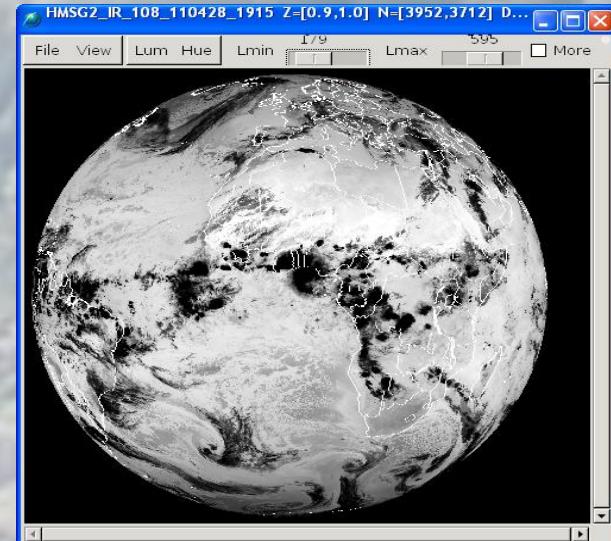
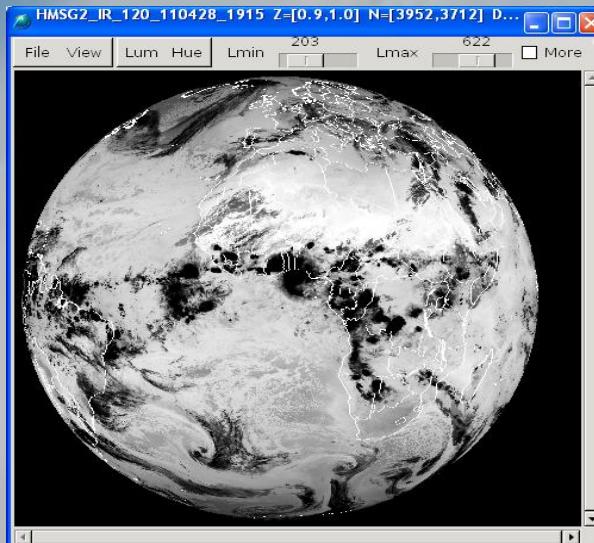
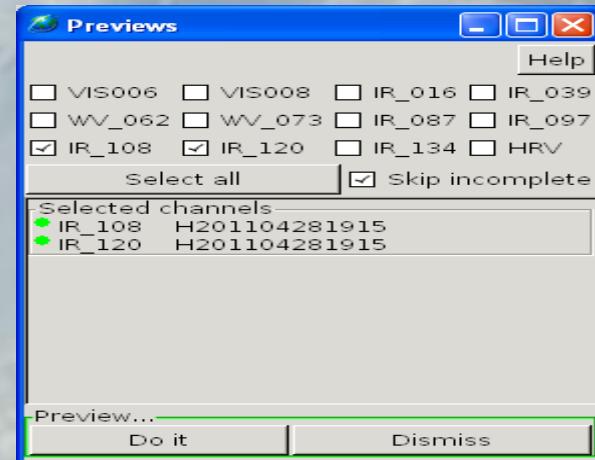
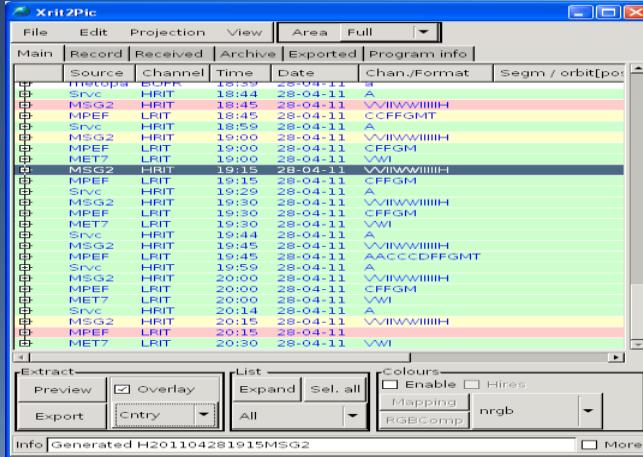


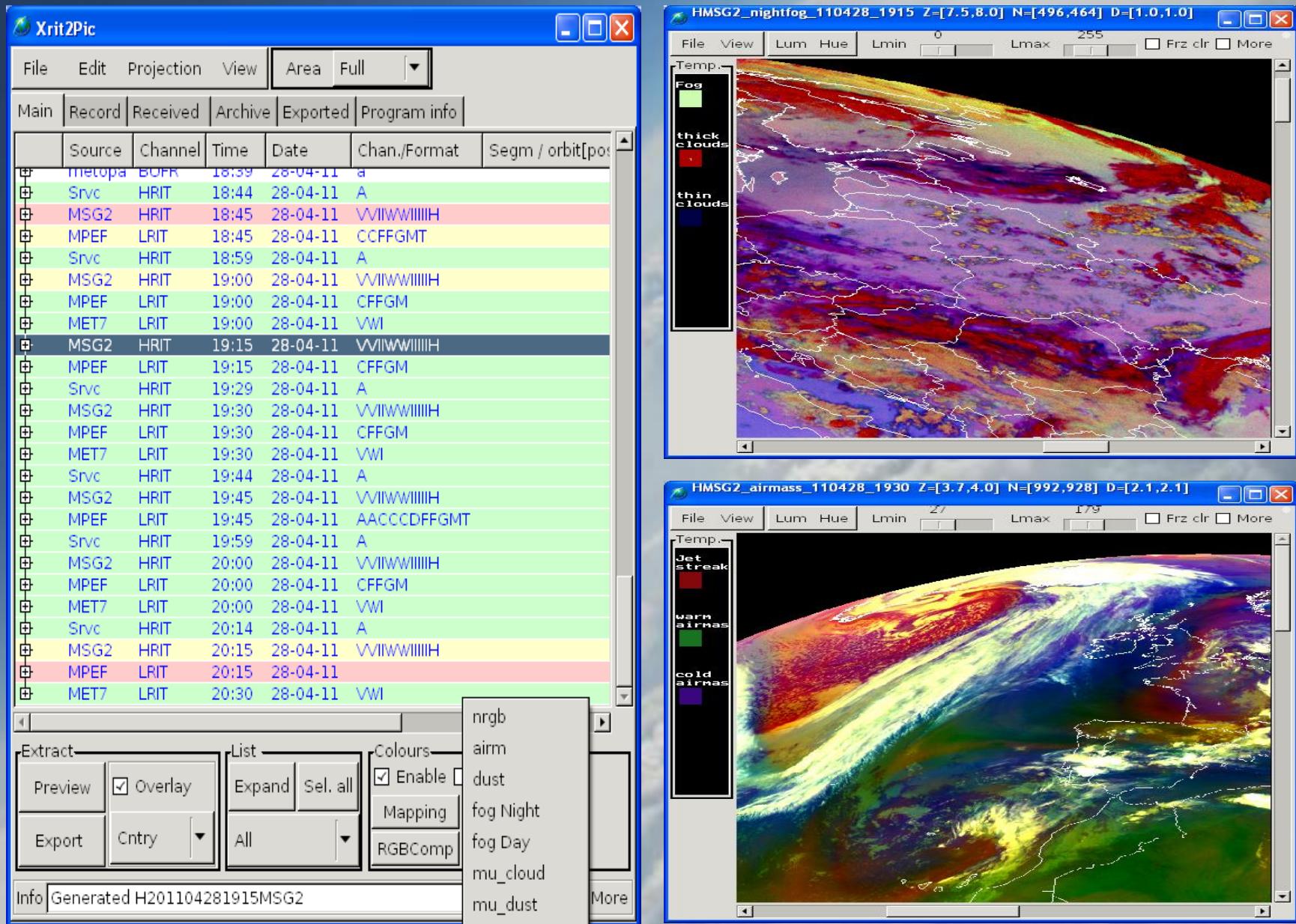
Processing methods and algorithms.

- Examples



Processing methods and algorithms.



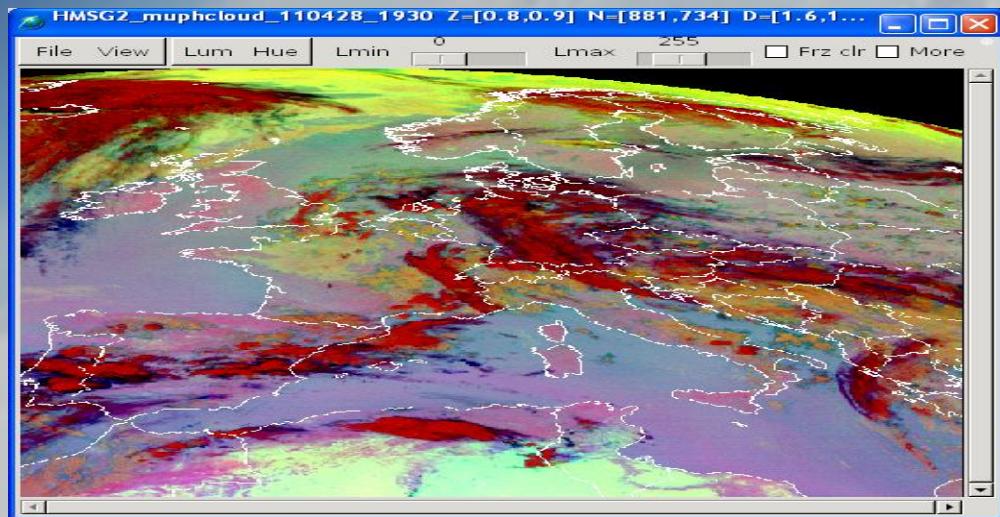


Colour map spec

RGB Composite type: Airmass

	Chan P	-	Chan N	Temp L	Temp H	Gamma
Red	WV_062	-	WV_073	-25	0	1.00
Green	IR_097	-	IR_108	-40	5	1.00
Blue	WV_062	-		243	208	1.00

Set



Colour map

Channel mapping

	Red	Green	Blue	Invert
Offset	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Gamma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIS006	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VIS008	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_039	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WV_062	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WV_073	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_087	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_097	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_108	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_120	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR_134	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HRV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Channel values

Mirror neg. values

	Red	Green	Blue
Offset	254	226	1770
WV_062	1019		-728
WV_073	-1019		
IR_097		566	
IR_108		-566	

Non-GUI Mode

- ❑ Next command translates all HRIT files with a channel name starting with VIS for every day with UTC time of 12:00. Only segments 7 and 8 are added to the picture (which is Europe).
 - ❑ **xrit2pic -nogui -type H -chan VIS* -segm 7-8 -time 12:00**
- ❑ Next is a example to do this translation 'forever'; each day the receive directory is cleaned.
 - ❑ **xrit2pic -nogui -type H -chan VIS* -segm 7-8 -time 12:00 -log**

Meteosatlib

<http://sourceforge.net/p/meteosatlib/wiki/Home/>

- Meteosat OpenMTP/HRI/HRIT C++ access libraries. This libraries allows programs to read geostationary EUMETSAT native formats. It also contains GDAL drivers and conversion programs.
- This library is used to read Meteosat files. No
 - decryption is performed. Files are expected to be already decrypted by using
 - the EUMETSAT key unit, or to be transitted already in clear form.
 -

How to install

- We need :
 - Geospatial Data Abstraction Library (gdal)
 - GribAPI
 - Netcdf
 - Png
 - Jpeg
 - Zlib, zslib

accessing datasets

- `msat --view /somepath/H-000-MSG3_-
MSG3_____ -IR_039____ -000005____ -
201307100230-C_`
- `msat --view
/somepath/H:MSG3:IR_039:201307100230`

Cropping

- msat --display --area="5760,1792,1126,1254"
H:MSG2:HRV:201203130715
- msat --display --
Area="31.5872,48.1860,2.7367,22.2706"
H:MSG2:HRV:201203130715

output formats

- msat --png --area="5760,1792,1126,1254"
H:MSG2:HRV:201203130715
- msat -c PNG --area="5760,1792,1126,1254"
H:MSG2:HRV:201203130715
- msat -c MsatGRIB --area="5056,2000,448,2000"
H:MSG2:WV_073:201001191215
- msat -c MsatNetCDF --area="5056,2000,448,2000"
H:MSG2:WV_073:201001191215