

Including Geostationary Satellite Data?

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What is available:

- ➔ **1983-present : Tropical belt coverage with GEO satellite**
- ➔ **The existing ISCCP DX and D1 cloud product climatology (30km, 2.5°)**
- ➔ **Futur: the ISCCP HXS and HGG cloud product climatology (10km, 1°)**
- ➔ **The GRIDSAT Version 2 and ISCCP HXG radiance data set (10km)**

One example of simultaneous observation of AIRS and GEO high clouds in the Tropics

Discussion

1983-present : Tropical belt coverage with GEO satellite

New generation:

2004: MSG/SEVIRI

2015:MTSAT --> HIMAWAHRI

Soon
GOES-R

1km to 3km,
Time sampling about 15'
and more for study cases

More channels

IR: 4km or 5km

Time sampling 30' or 1H

Channels: IR, VIS, WV
IR 10.8 μ , IR 12 μ , IR 3.9 μ

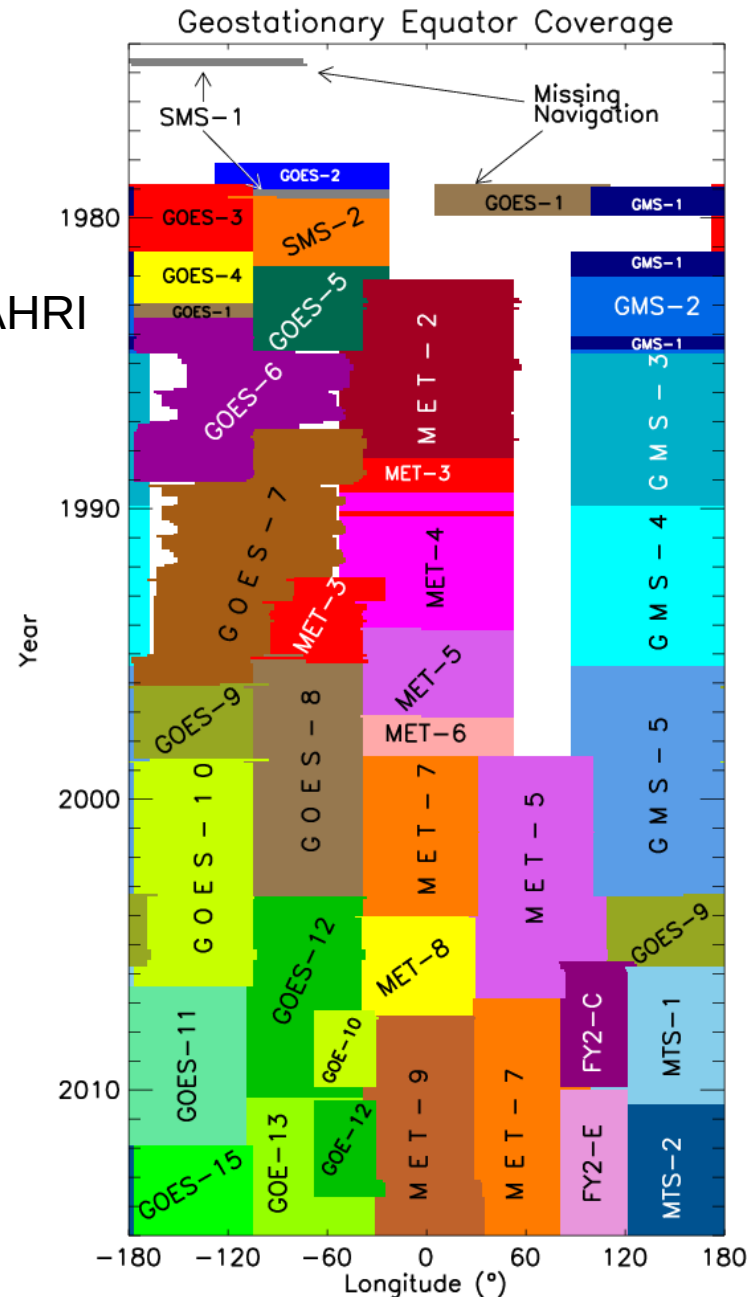


Figure from Knapp et al. 2013

The ISCCP geostationary data archive

The B1 radiance data set: from June 1983 to present the Geostationary VIS, IR and WV radiances are archived with 8km to 10km spatial resolution and 3H time sampling.

DX, D1 ISCCP data set built from the B3 radiance data set: a sub-set of the B1 data set (sampling from 10km to 30km). (Rossow and Schiffer, 1991)

New HXS, HGG ISCCP data set built from the B1 radiances (no spatial sampling)

The existing ISCCP DX cloud product climatology

Product given for each geostationary satellite separately:

Cloud mask, cloud top temperature, cloud top pressure, cloud optical thickness (daytime)

IR and WV Brightness Temperature, Visible reflectance

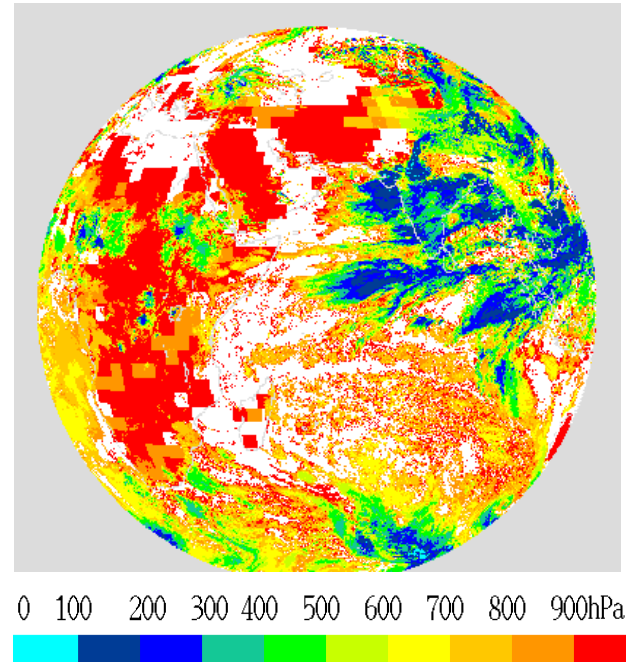
June 1983 until December 2009:

5km to 10km pixels sampled each 30km,

3H sampling

Grid: satellite projection

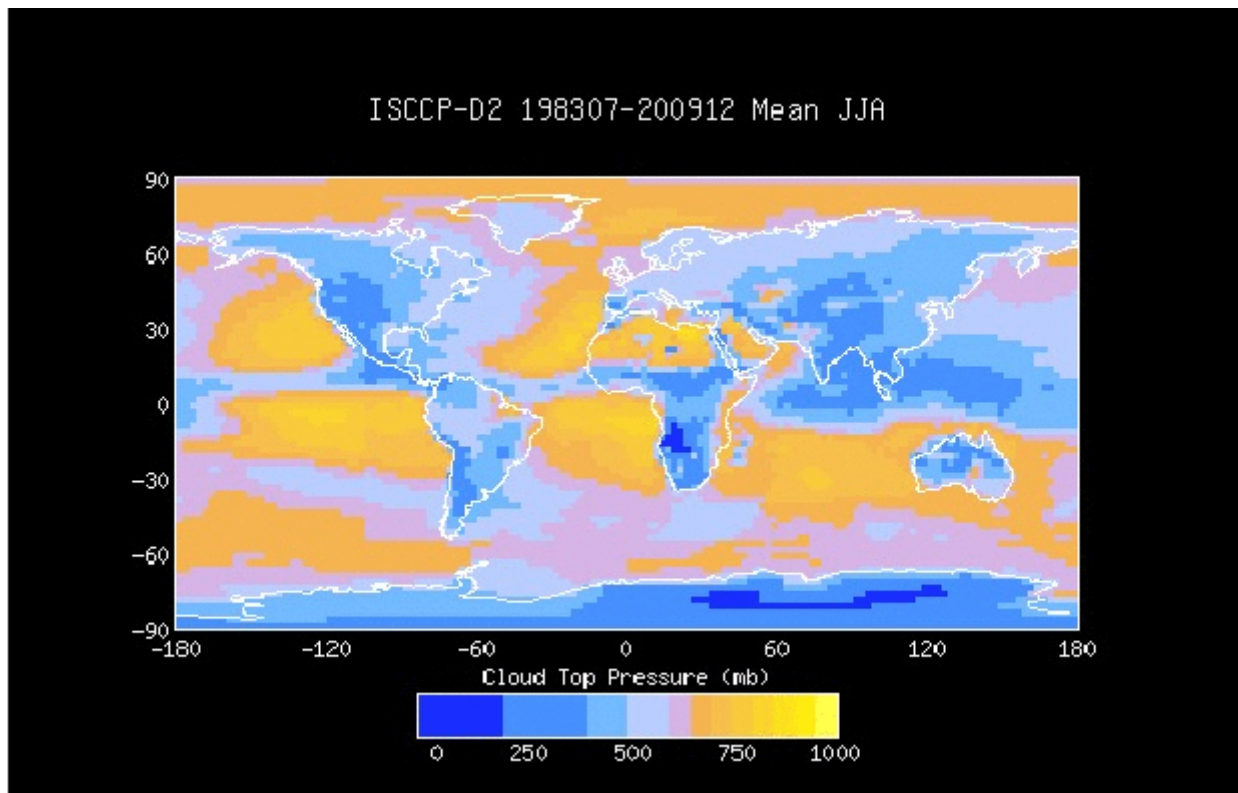
METEOSAT 7 – Indian Ocean
Cloud Top Pressure – 15 July 2009- 09UTC



The existing ISCCP D1 gridded cloud product climatology

All DX geostationary data set remapped on a 280kmx280km grid (2.5°x2.5° at equator)
Period: June 2003 – December 2009
3H time sampling

Cloud Top Pressure - July - 1983-2009



(ISCCP GISS web site)

Soon the ISCCP HXS and HGG cloud product climatology

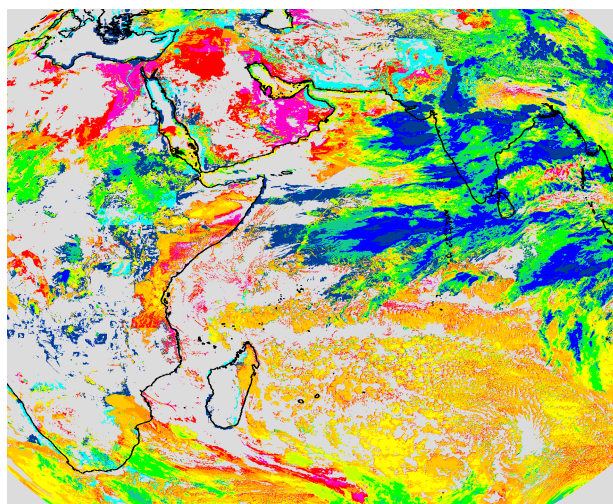
Use of the ISCCP B1 Geostationary data archived (8km to 10km resolution each 3H – June 1983 to present) with an improved algorithm, with improved radiance calibration and with improved auxiliary data set.

Globally merged and mapped product will exist at pixel level and 1°x1° resolution.

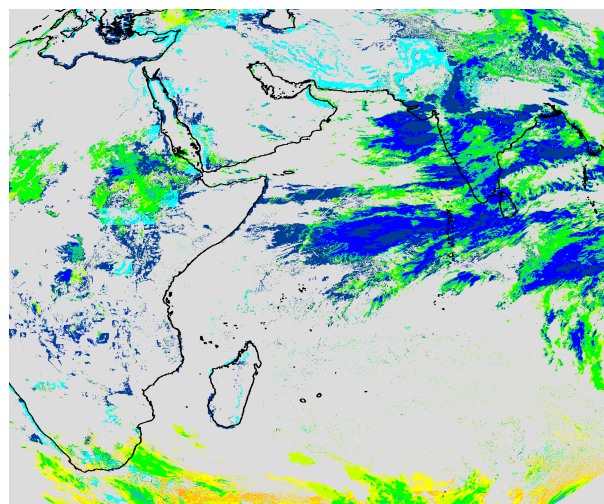
The algorithm can also be applied at full spatial and temporal resolution (5km, 30')

METEOSAT 7 – Indian Ocean
Cloud Top Pressure – 15 July 2009- 09UTC

Cloud top pressure



Ice cloud top pressure



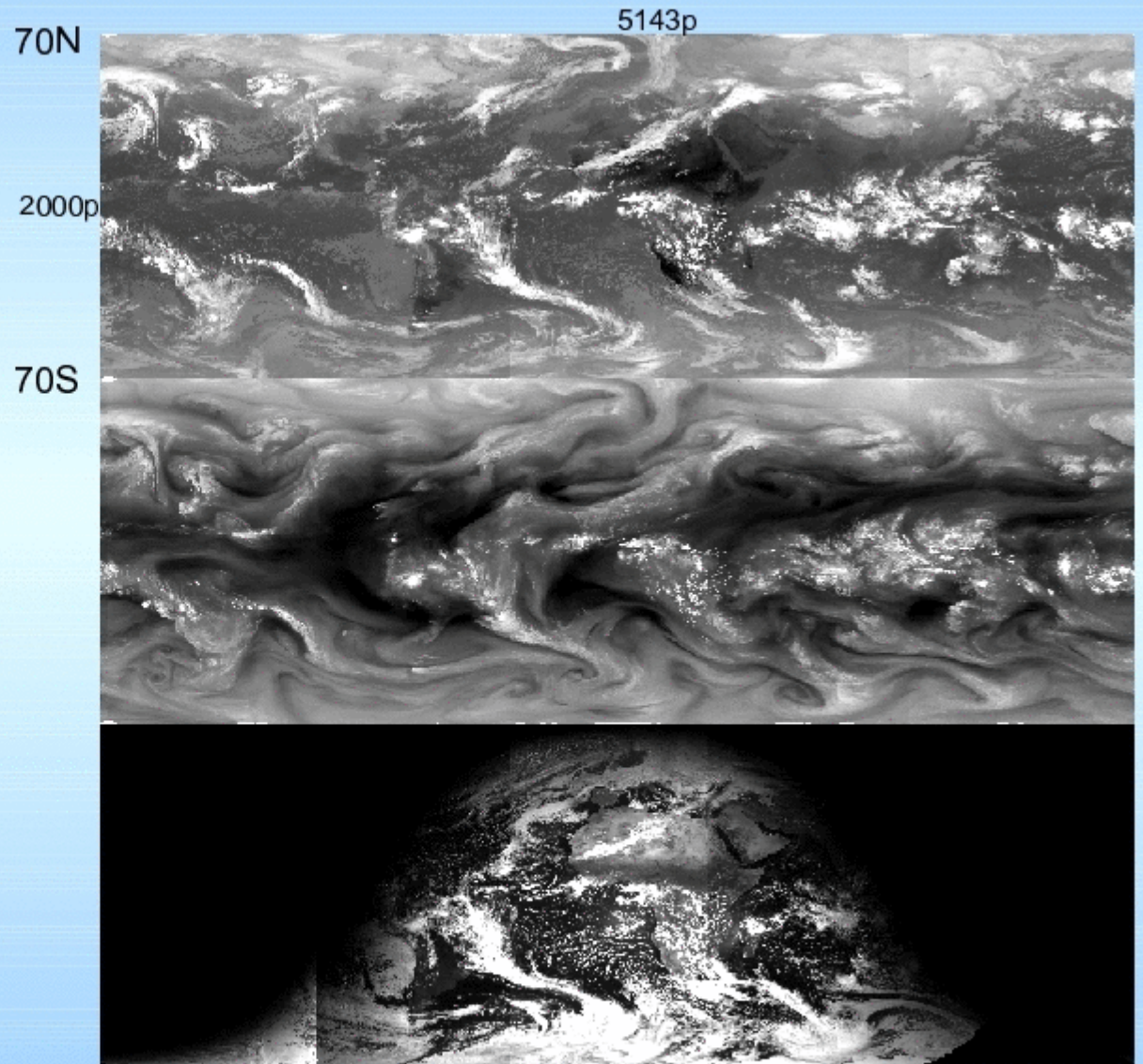
0 100 200 300 400 500 600 700 800 900hPa



(Result of ISCCP HXS retrieval process at LMD using full resolution data. Collaboration with W.B Rossow)

BEFORE the venue of ISCCP HXG data set: the GridSat B1 data set

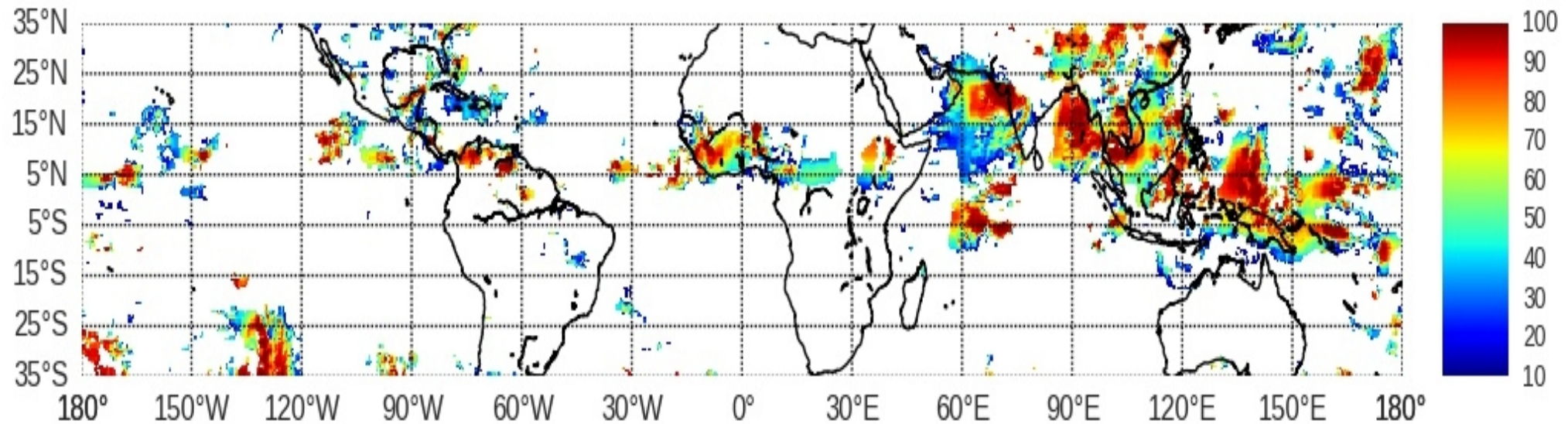
- Infrared window data
 - From ISCCP B1 files
- Geostationary satellites
- Gridded to facilitate...
 - Reading
 - Calibrating
 - Processing
- NetCDF format
- 3 hourly for 1980-2015
- ~8 km resolution
- Collateral products
 - Visible channel
 - Infrared water vapor
- Used for...
 - Solar energy
 - Precipitation
 - Diurnal cycle of OLR
 - ITCZ & SPCZ studies
 - Hurricane studies
 - Sfc heat fluxes
 - Famine early warning



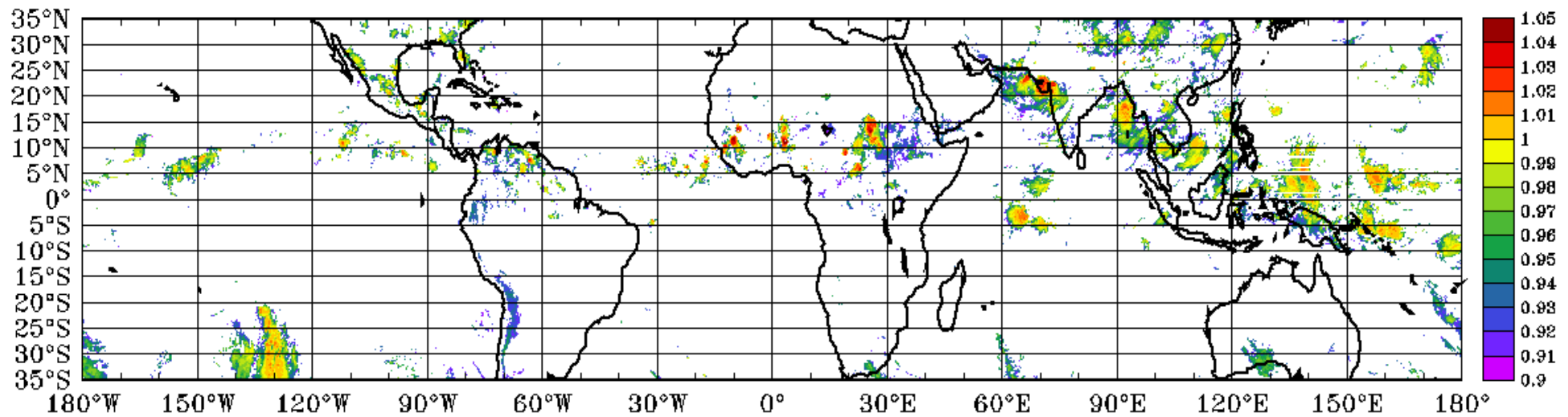
1 July 2007 – 0130 AM local time

AIRS High cloud emissivity

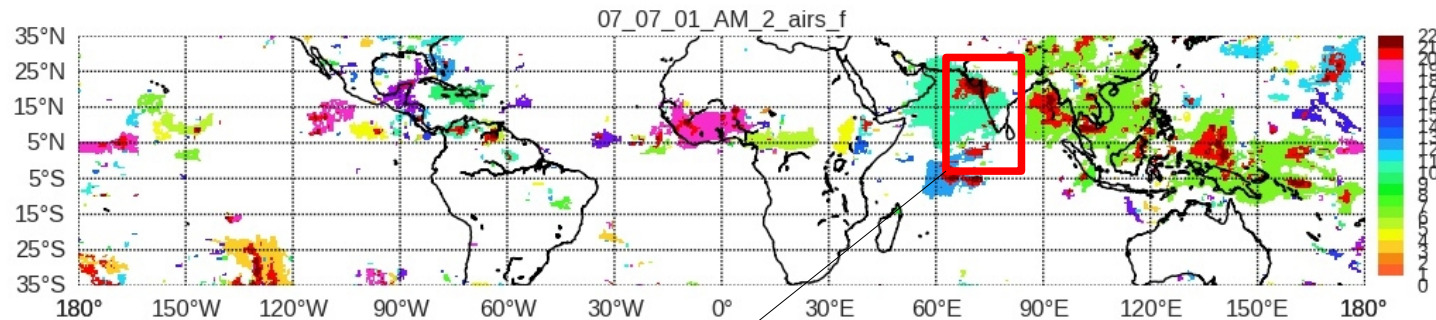
(Sofia Protopapadaki talk)



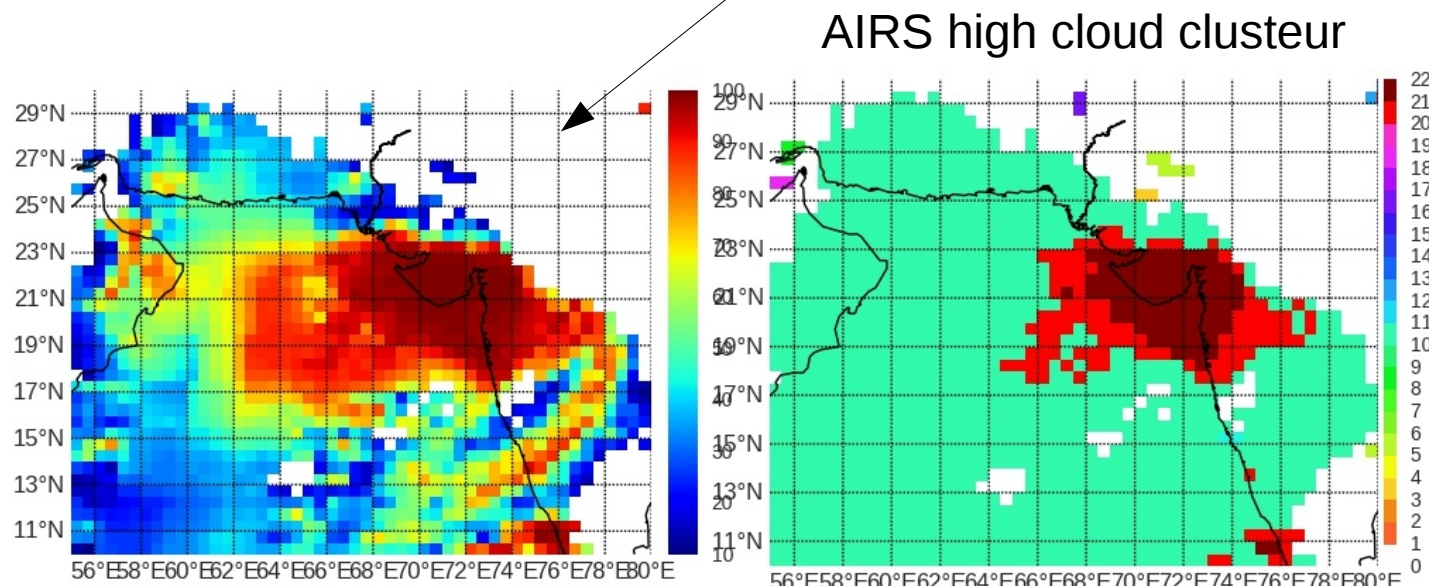
GridSat WV/IR ratio and $IR < WV + 20K$



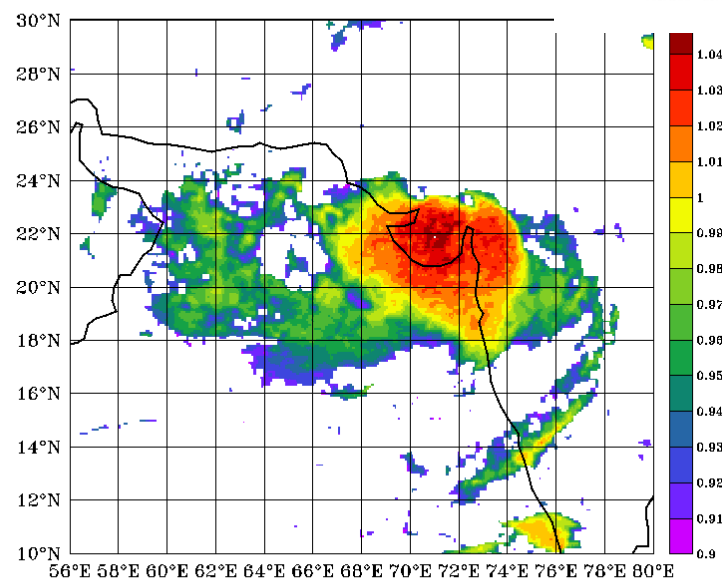
AIRS high cloud clusteur



AIRS high cloud emissivity



GridSat WV/IR ratio



(Sofia Protopapadaki talk)

Discussion

Use IR, WV (and VIS?) GridSat data to help in the AIRS cloud cluster gap filling and to follow the cluster between LEO overpass. Use HXS data set when it will be available.

Create a geostationary high cloud cluster data base? Would be the link between other data set.

Increase the temporal (and spatial) resolution?

- geostationary data set available at ICARE: 2009 to present – at the best spatial and temporal resolution available.

The generation of geostationary data set: more channels, better temporal and spatial sampling
→ SEVIRI, HIMAWARI, GOES-R

Better spatial and temporal resolution: improvement of the retrieval of cloud properties

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