

Global dataset of geostationary meteorological satellites and its applications

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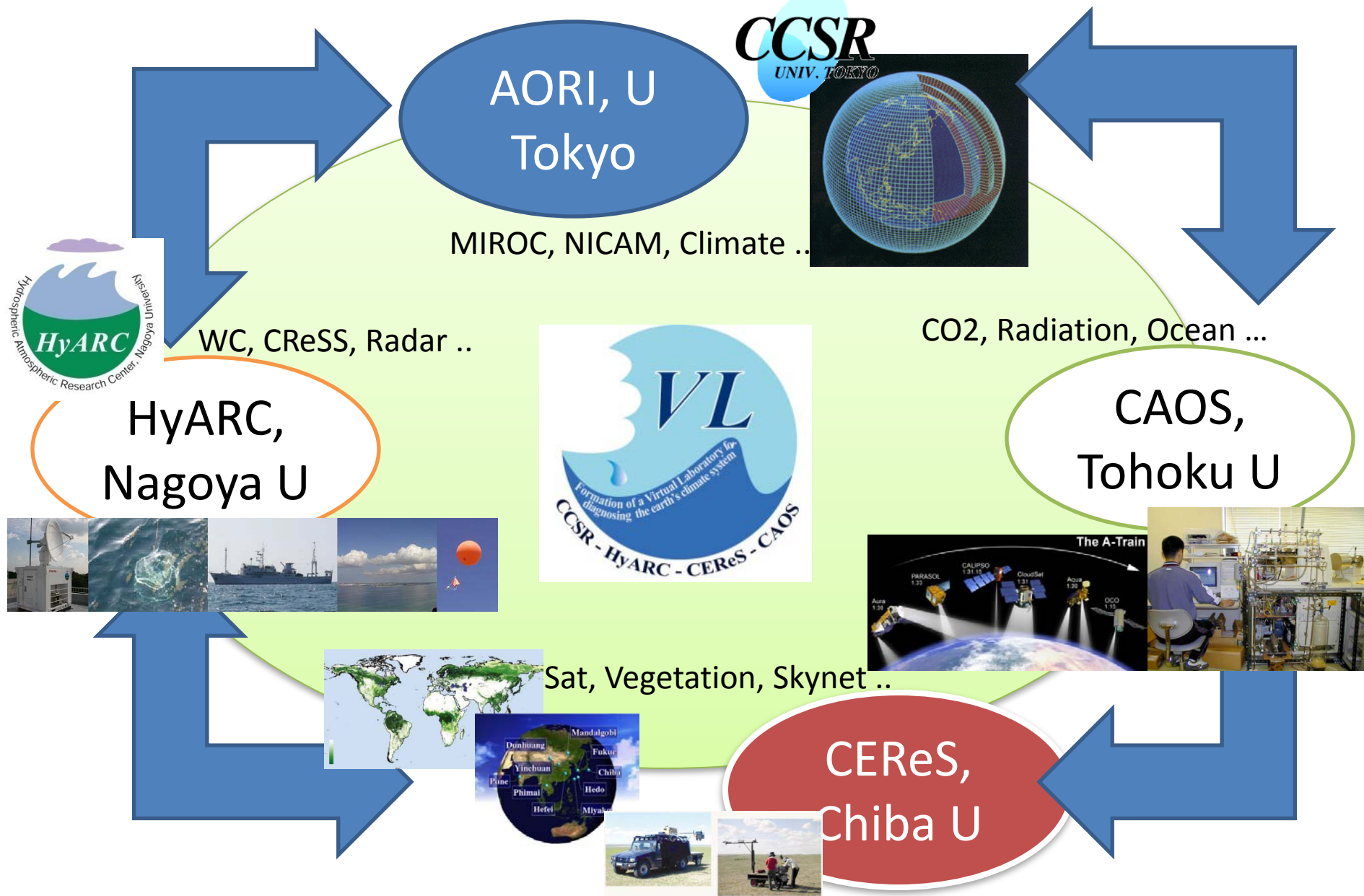
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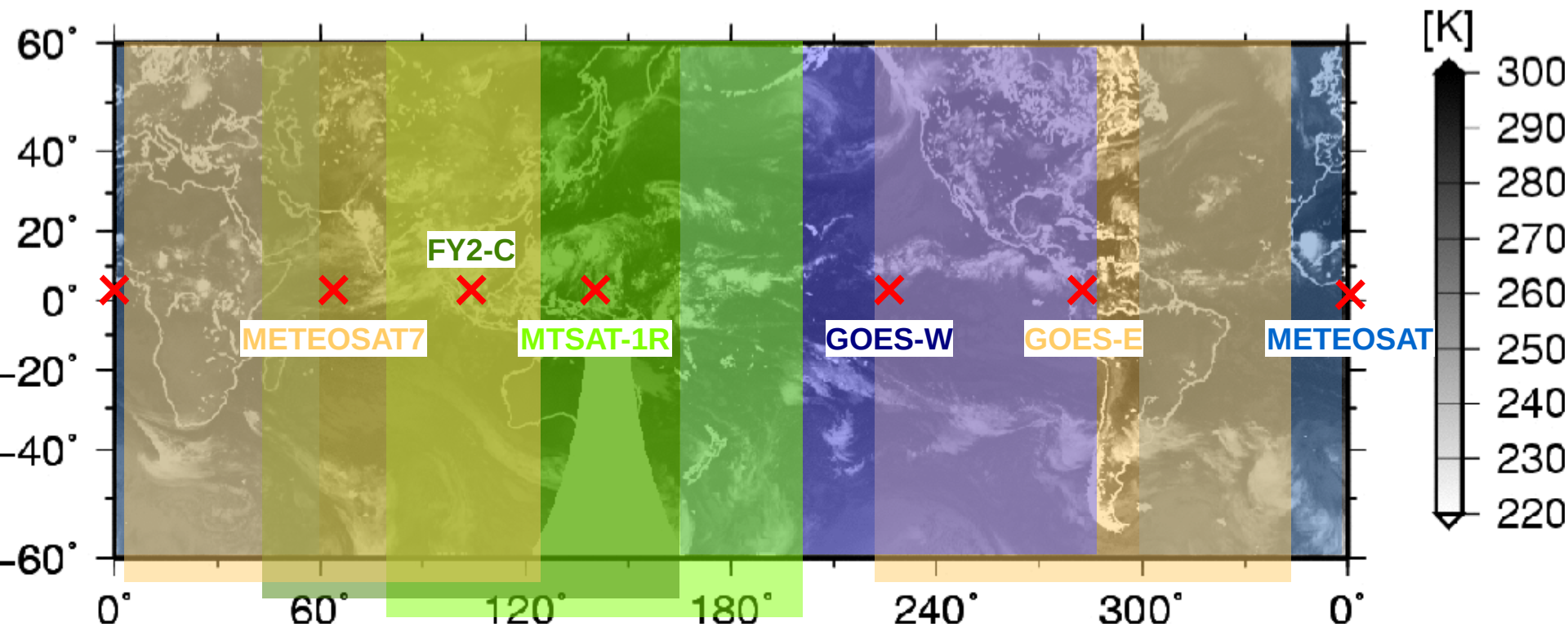
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VL formation (<http://www.cr.chiba-u.jp/~4vl/>)





(NCEP/CPC 4 km Global IR Dataset, NASA GSFC DAAC)

- (at least) latest a ten year six GEO data archiving
- Grided data product generation & sensor calibration algorithm
- Open data (JMA GEOs, GOES-W, -E, FY-C, -E?) via anonymous ftp servers, MTSAT2, FY, GOES-W, -E are quasi-realtime processing & data released.
- ALL channels, such as VIS ($0.63 \mu\text{m}$), IR1 ($10.8 \mu\text{m}$), IR2 ($12.0 \mu\text{m}$), WV ($6.75 \mu\text{m}$), released

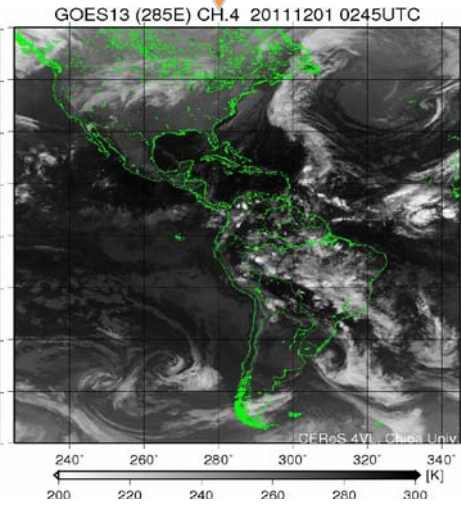
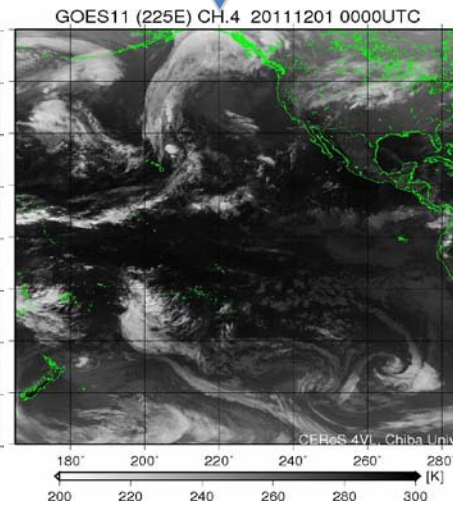
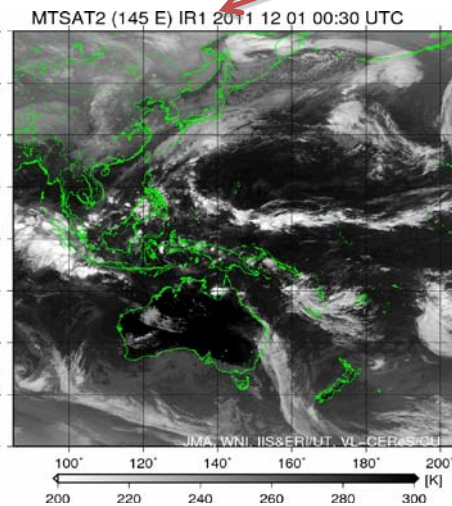
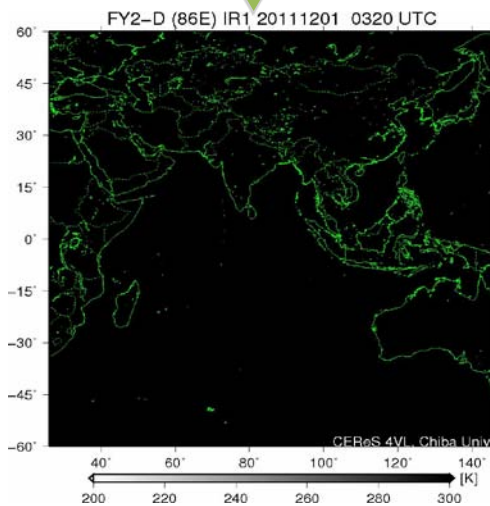
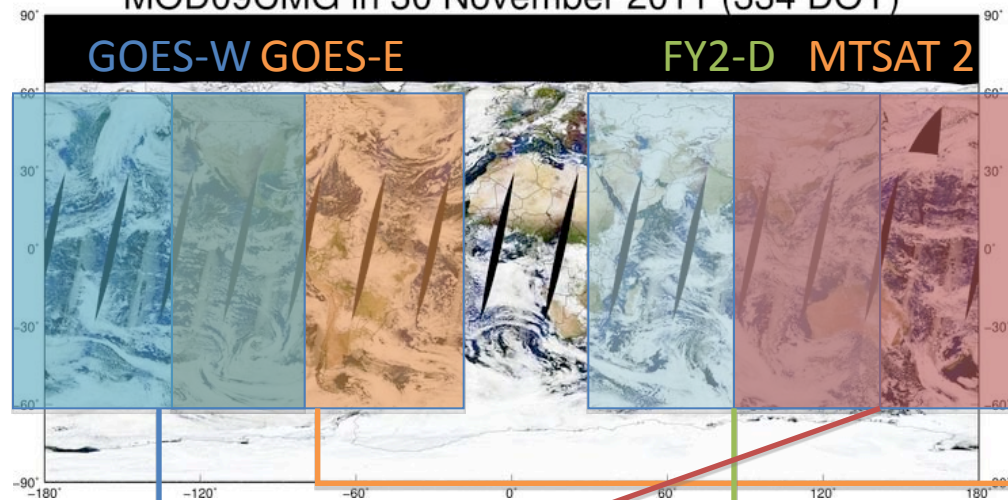
GEO name	Grided resolution	Zonal Range	Grided version	Status
MTSAT-1R -2	VIS: 0.01° IR: 0.04°	80° –200° (-1R) 85° - 205° (-2)	Ver 2 (improve ver.)	All past records ○ Quasi-realtime ○
FY2-C, -D, (-E)	VIS: 0.01° IR: 0.04°	44.6° –164.6° (-C, -E) 26° - 146° (-D)	Ver 2 (improve ver.)	All past records △ Quasi-realtime ○
METEOSAT -IDOC	0.04°	-2.5° –117.5°	Ver. 2 (improve ver.)	Internal data use only (EUMETSAT policy)
METEOSAT, MSG	0.04°	-60° –60°	Ver. 2 (improve ver.)	Internal data use only (EUMETSAT policy)
GOES W, E	0.04°	225° –345° 165° –285°	Ver 2 (improve ver.)	Since 1996 All past records (FD): ○, NH, SH: △; Q-realtime ○

- Grided format (*level 1b*) common specifications

 - ▶ 60° S – 60° N, basically hourly (depend on GEO operation schedules)
 - ▶ 1 channel 1 simple binary file (DN), vis.tar.bz2, irs.tar.bz2
 - ▶ Calibration tables released by each agencies also included.
 - ▶ For 2 byte raw data (more than 8 bits), big endian byte order stored.
 - ▶ anonymous ftp servers (access limit for Meteosat dataset)

Quasi-Realtime, 3hourly: Dec 01 – Dec 05

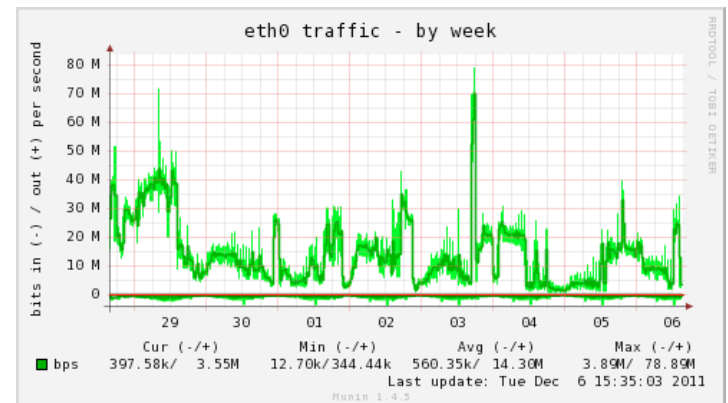
MOD09CMG in 30 November 2011 (334 DOY)



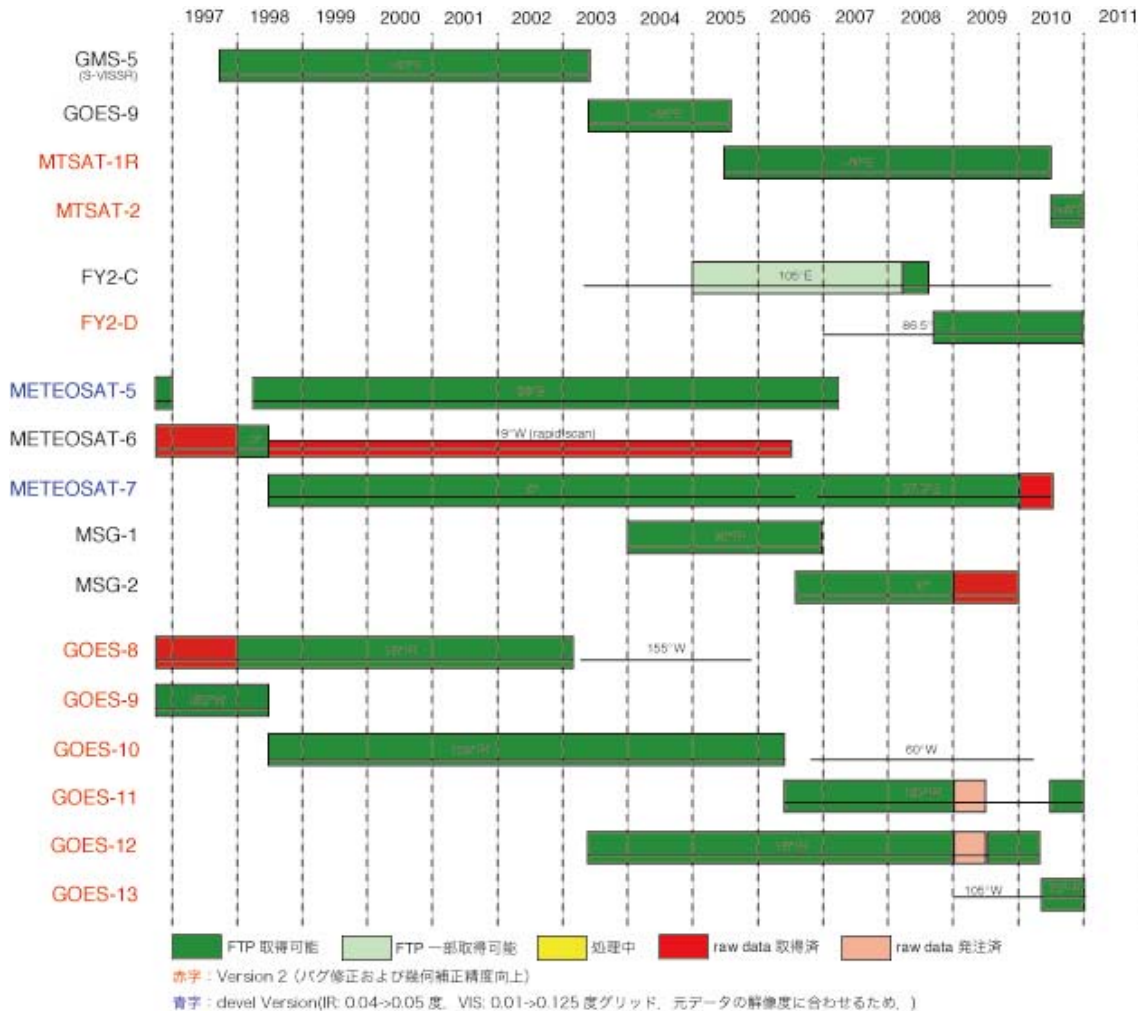
Downloaded data (unit: files)

Year	Internal of Chiba University	Outside of CU
2006	332,042	157,144
(Start VL project) 2007	689,416	53,080
2008	424,683	136,851
2009	4,631,911	865,566
2010	7,094,828	1,332,153
2011 (to September)	1,589,492	1,450,215
Total: 2005-2011	15,009,618	3,942,439

- Most of download files since 2009 are MTSAT data
 - Currently 10-20 Mbps download traffic always happen for MTSAT server.



Current archive & release status



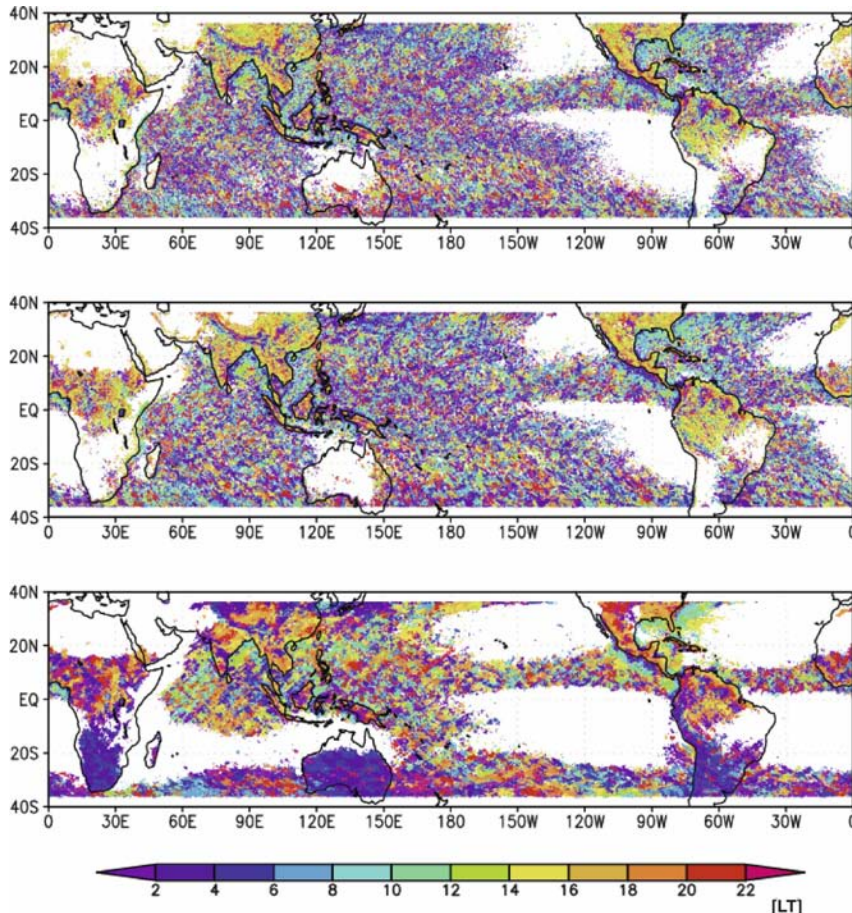
- Green is completely finished data processing and open data.
- Red is partly finished
- SH, NH mode in GOES-W, -E is on the way of processing

Research application examples

- Clouds propagation from coastline to the ocean over Tropic regions revealed by GEO.
- Evaluation of Cloud Resolving Model (CReSS) by GEO and TRMM satellites.
- Estimation short wave radiative flux
(by Dr. Takenaka in afternoon's presentation)

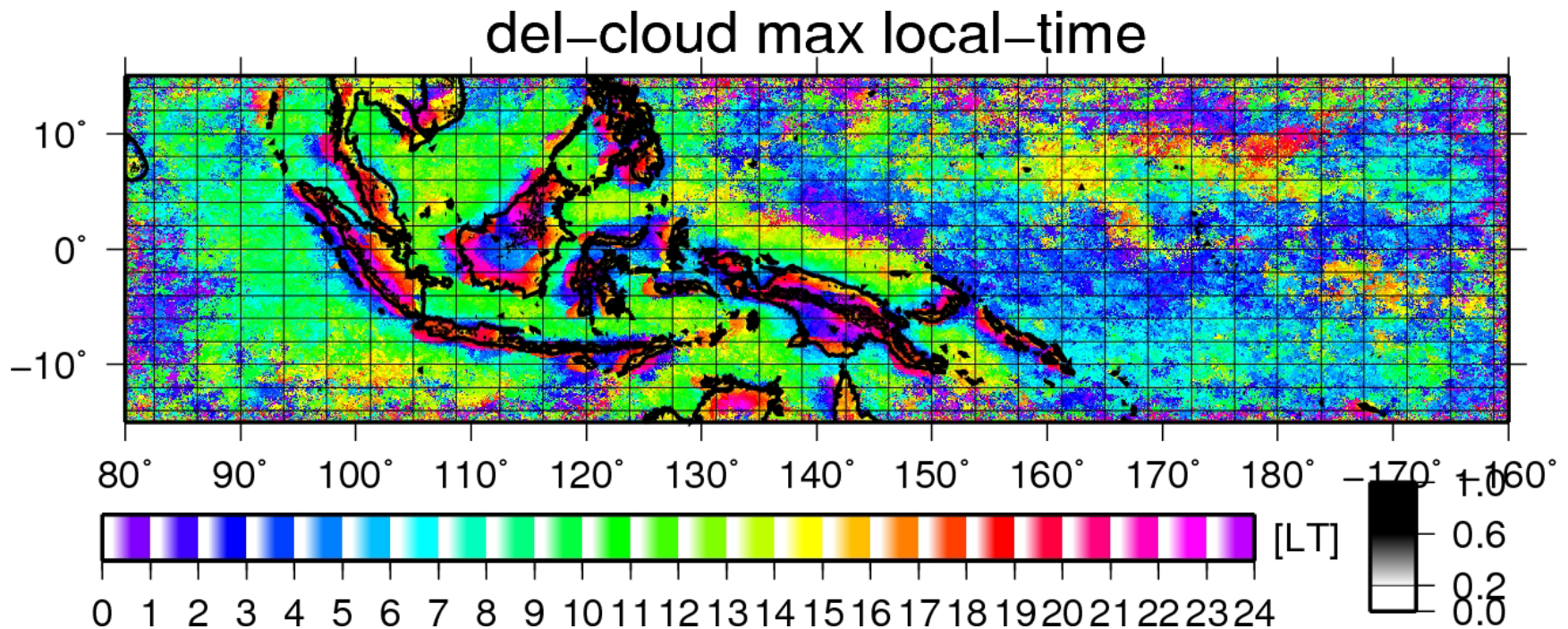
Diurnal peak time for three sensors boarded by TRMM

(Yamamoto et al., 2008, JC)

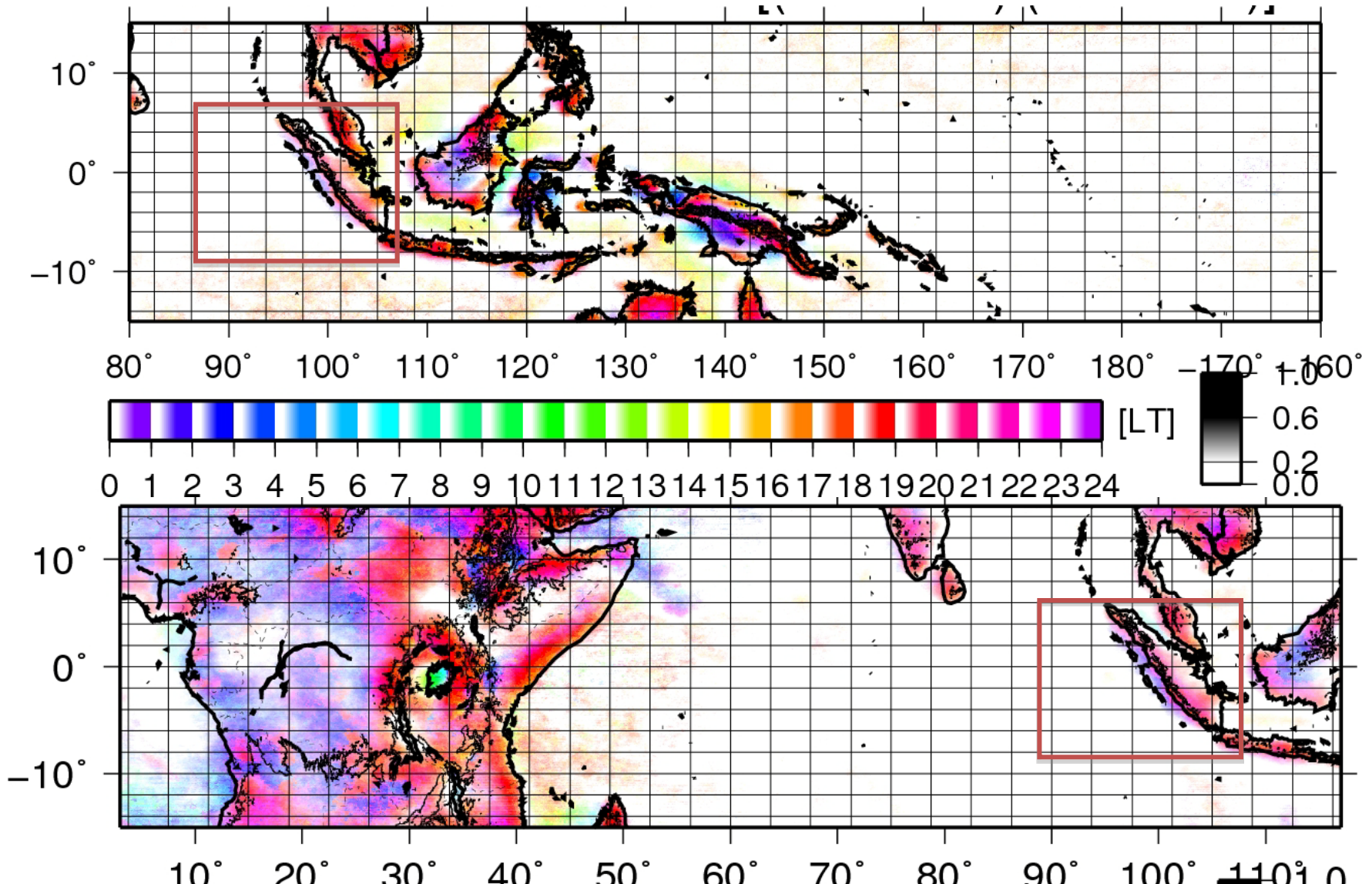


- TRMM PR: Radar observation
- TRMM TMI: Microwave signature retrieving RR
- TRMM VR: minimal Tbb by thermal IR imager
 - A ten years data used, but see the orbit path related signal

Minimal Tbb local time derived from MTSAT-1R (2005-2010)

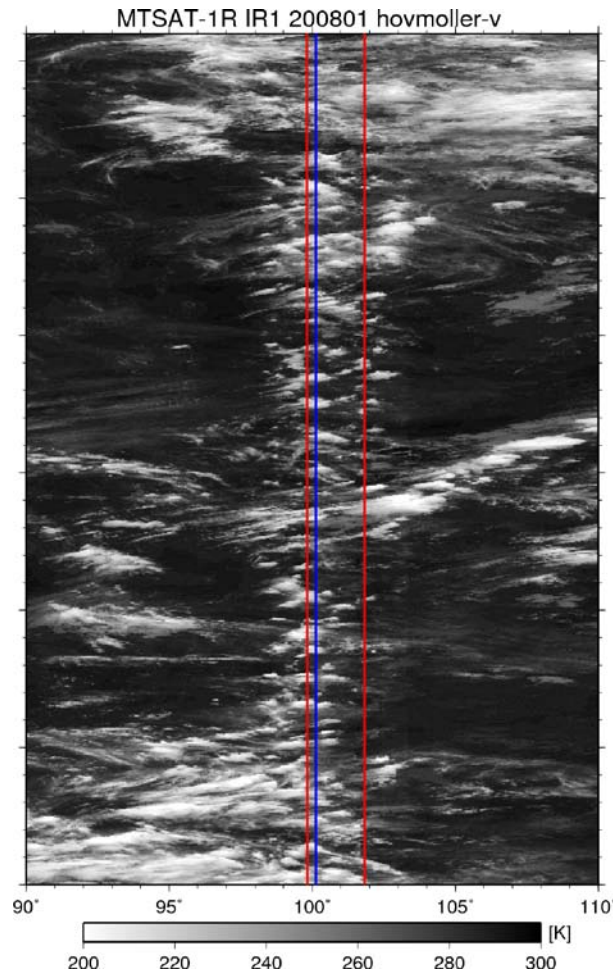


Highest cloud amount frequency with normalization (MTSAT-1R, Meteosat-IDOC)

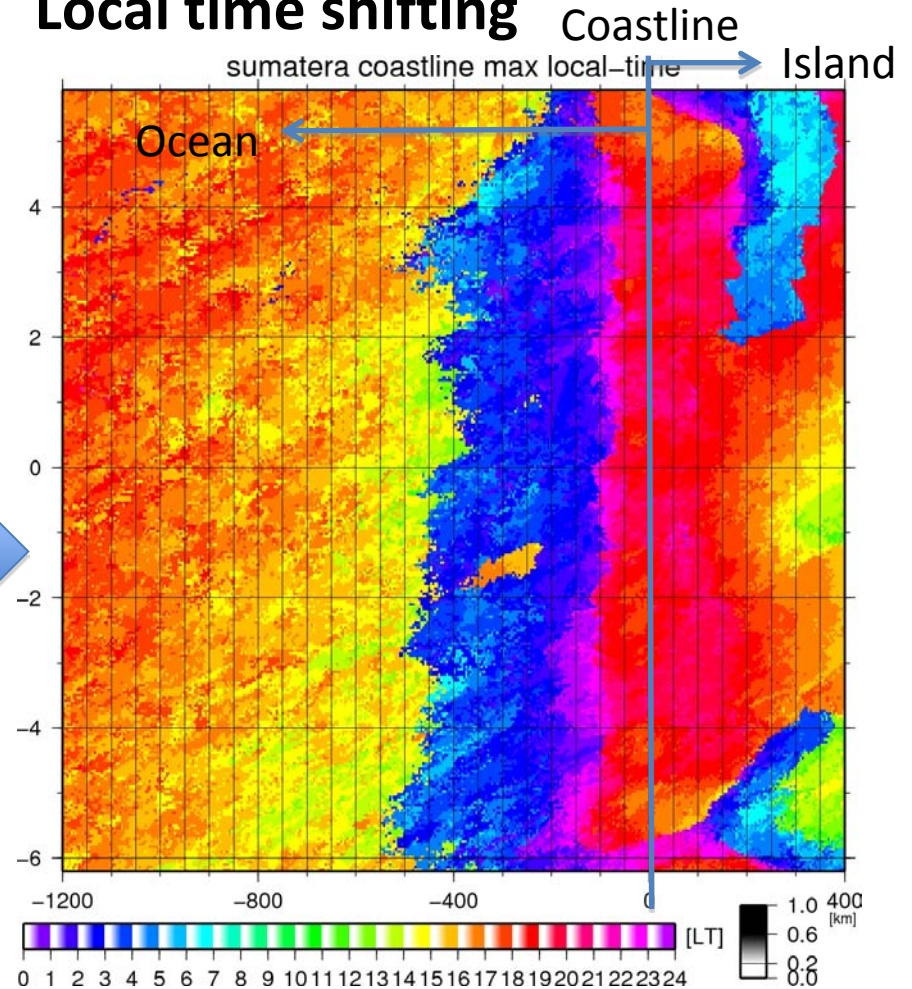


Local time shift due to isolated clouds propagation from coast to the ocean over Sumatra Island

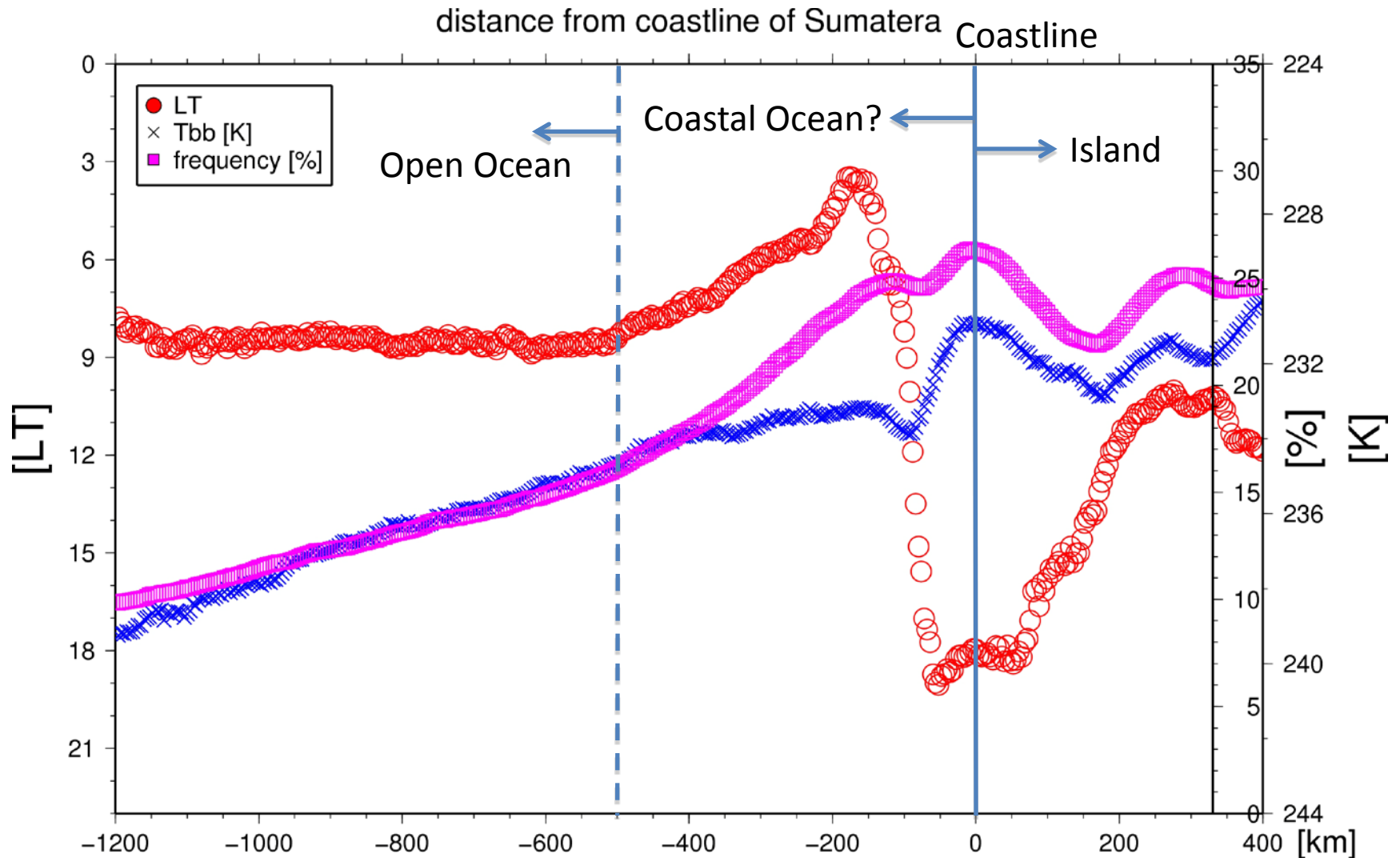
Time-Longitude Cross section



Local time shifting

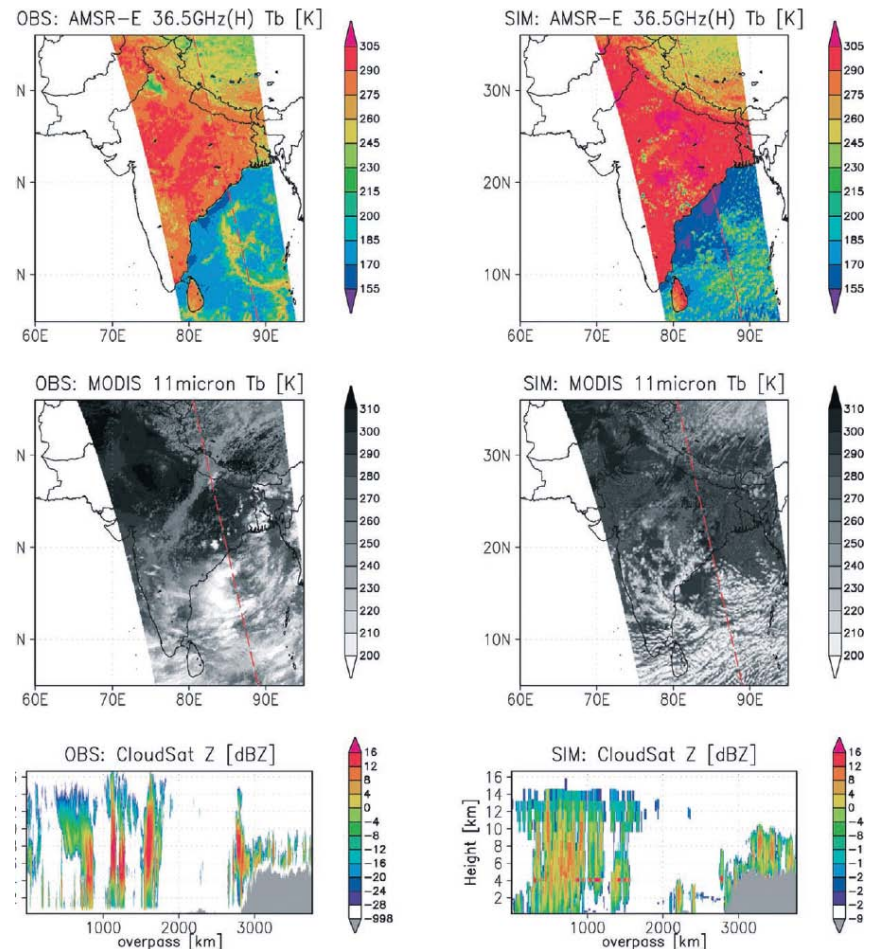
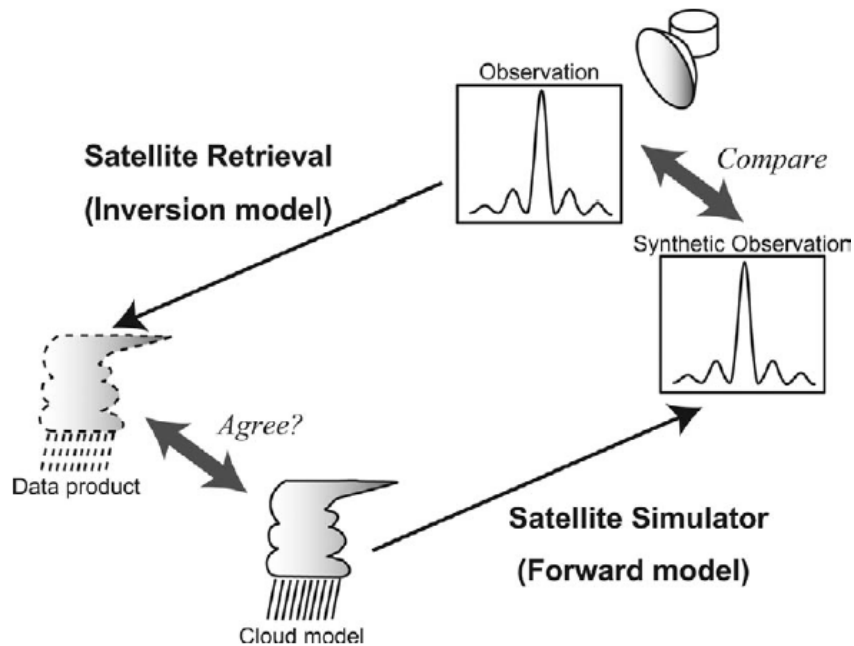


Aggregated relations from coastline to ocean for Sumatra Island



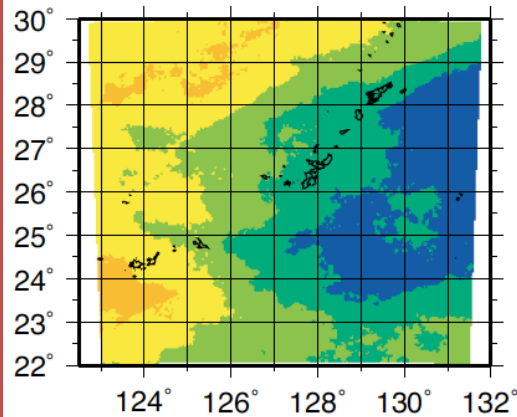
Evaluation Tool for CRM

Satellite Data Simulation Unit (SDSU)

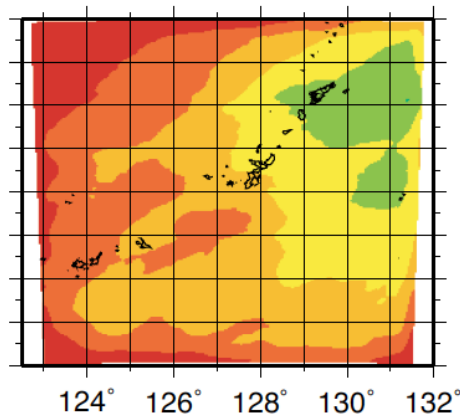


MTSAT observation vs CReSS-SDSU simulated Tbb distributions

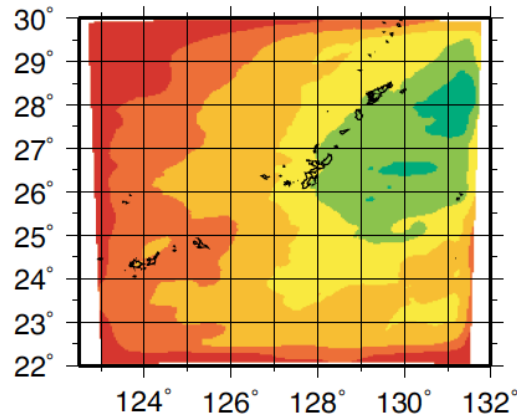
(a) MTSAT-1R



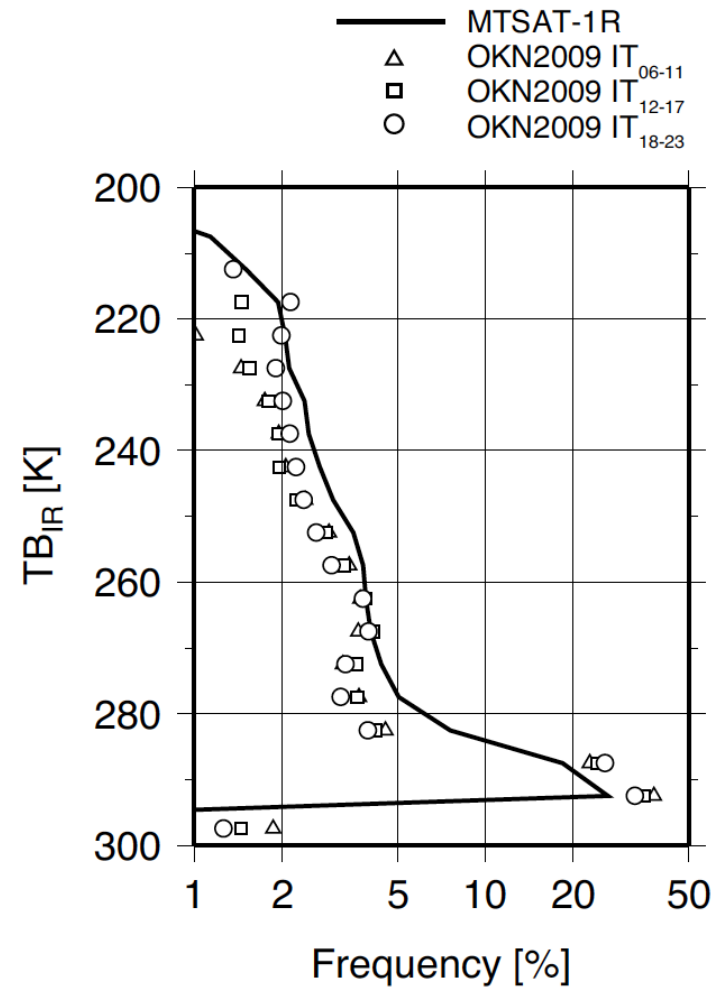
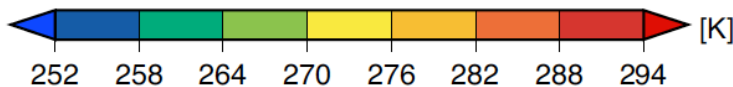
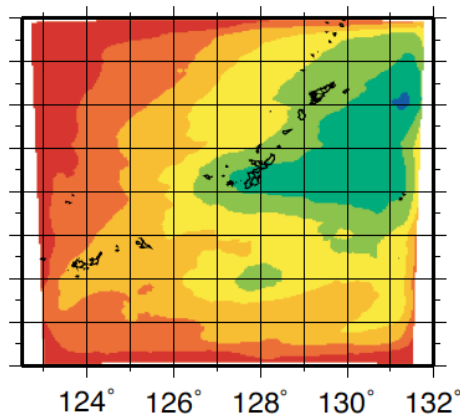
(b) OKN2009 IT₀₆₋₁₁



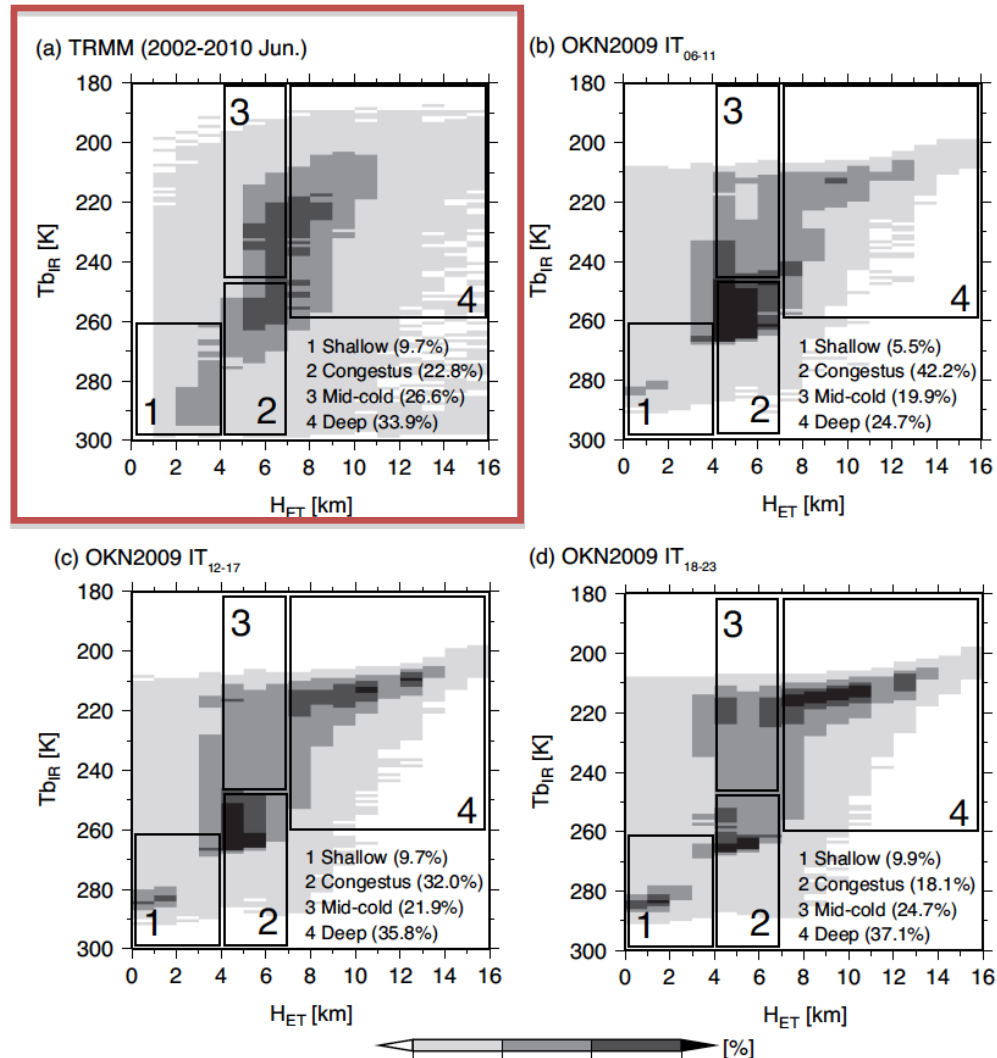
(c) OKN2009 IT₁₂₋₁₇



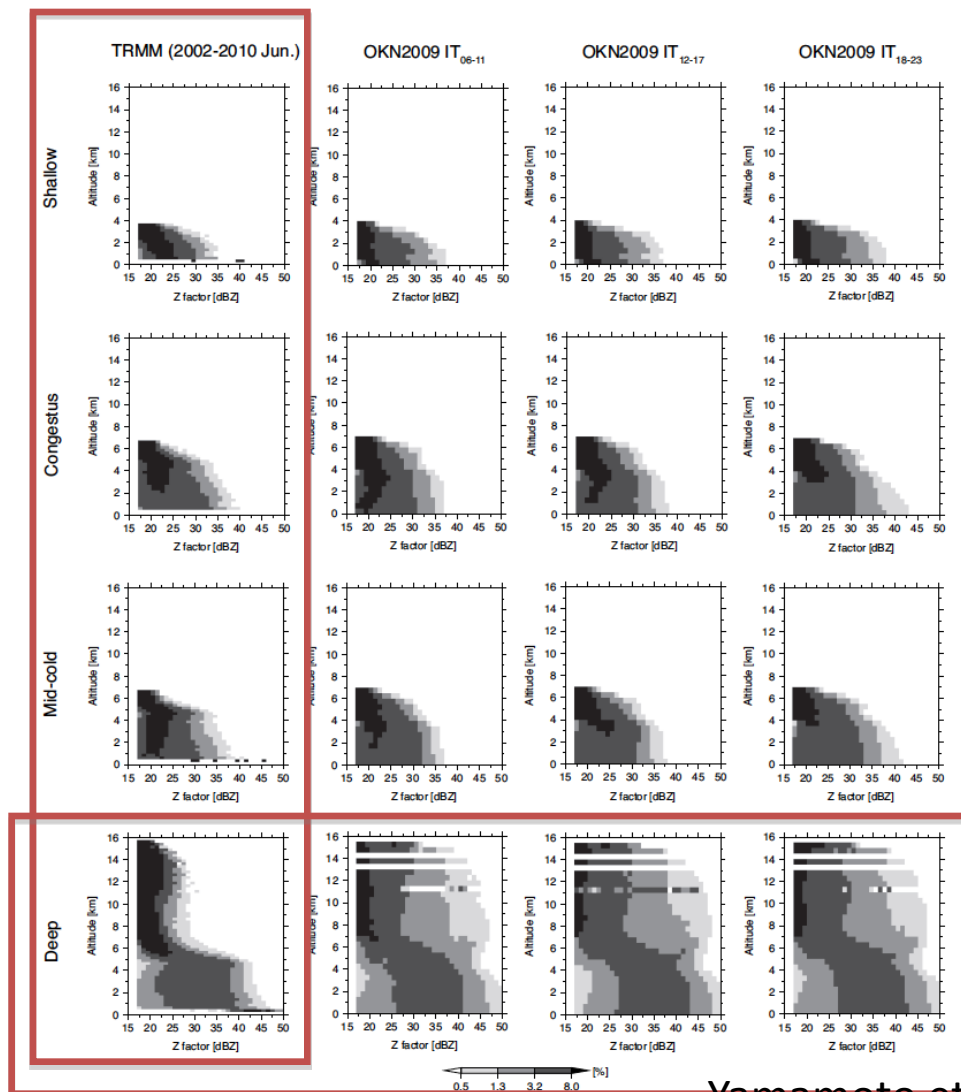
(d) OKN2009 IT₁₈₋₂₃



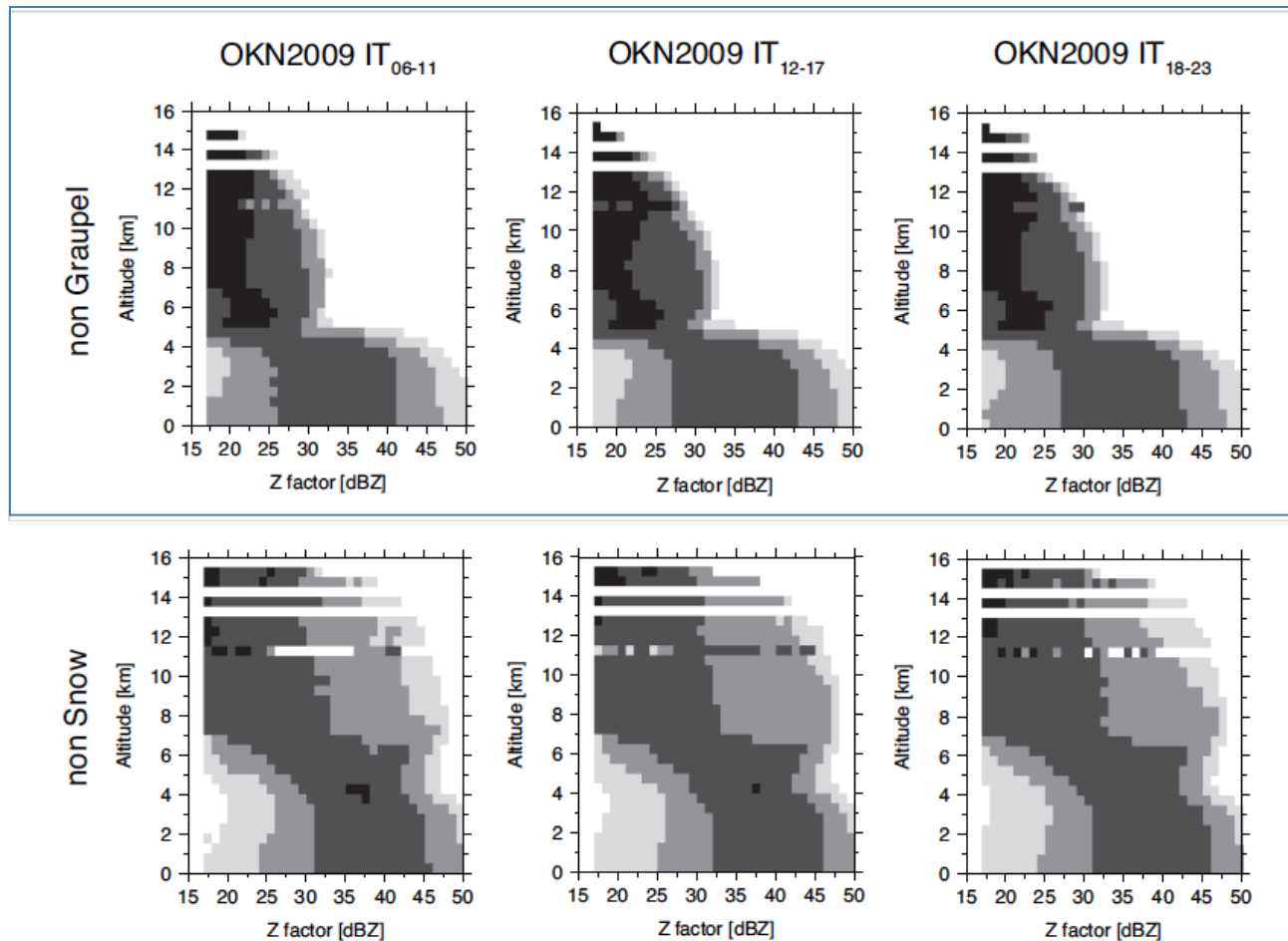
IR Tbb storm height diagrams for diagnosing clouds developing stage



CFAD (observed & CReSS-SDSU)



Simulated CFAD without graupel or snow



ftp servers& website

- VL-CEReS: <http://www.cr.chiba-u.jp/~4vl/>
 - CEReS DB : <http://www.cr.chiba-u.jp/~database-jp/>
 - MTSAT: <ftp://mts.cr.chiba-u.ac.jp/>
 - GMS5: <ftp://geoinfo.cr.chiba-u.jp/pub/satellites/geostationary/>
 - FY2-C, -D: <ftp://fy.cr.chiba-u.ac.jp/>
 - GOES-E, -W: <ftp://goes.cr.chiba-u.ac.jp/>
 - Meteosat: sorry, internal only

