Plenary Discussion 3

3rd AMV Intercomparison Study

AMV Intercomparison Studies

A key goal of these AMV inter-comparison studies is to learn and understand similarities and differences in AMVs produced at different operational centres, and ultimately, to improve their quality and consistency.

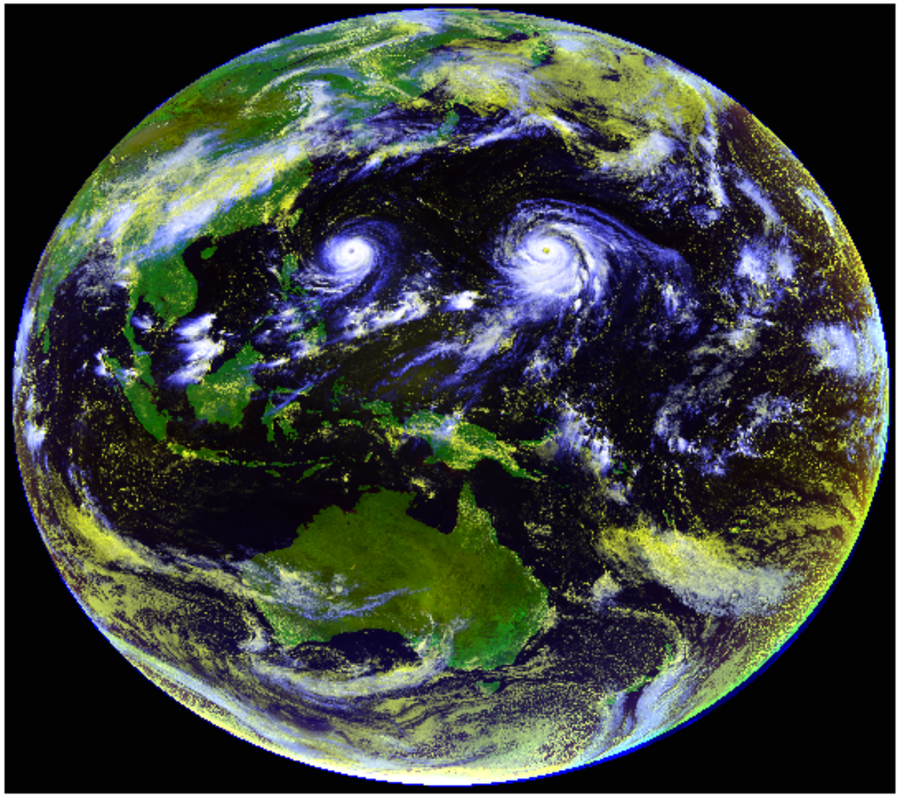
Participants

- JMA
- KMA
- CPTEC
- EUMETSAT
- NWC SAF
- CMA
- NOAA
- NASA/JPL
- BoM
- ISRO

“Golden Day”

- **For the 3rd AMV inter-comparison study it is proposed to use an image triplet from JMA’s Himawari-8/AHI**
  - The new spectral channels will bear new information on cloud microphysics
  - The higher temporal resolution will be useful to better understand the characteristics of the tracked cloud.
  - IWWG will select image triplets from H-8/AHI golden day (August 19, 2015) data that the ICWG intends to use for its next cloud inter-comparison study
    - Cloud products well studied and characterized by ICWG members
    - Two typhoons with a multitude of different cloud regimes
    - CALIPSO data/products, collocated to H-8/AHI data, are available for validation

clavrx_H08_20150819_0330.level2

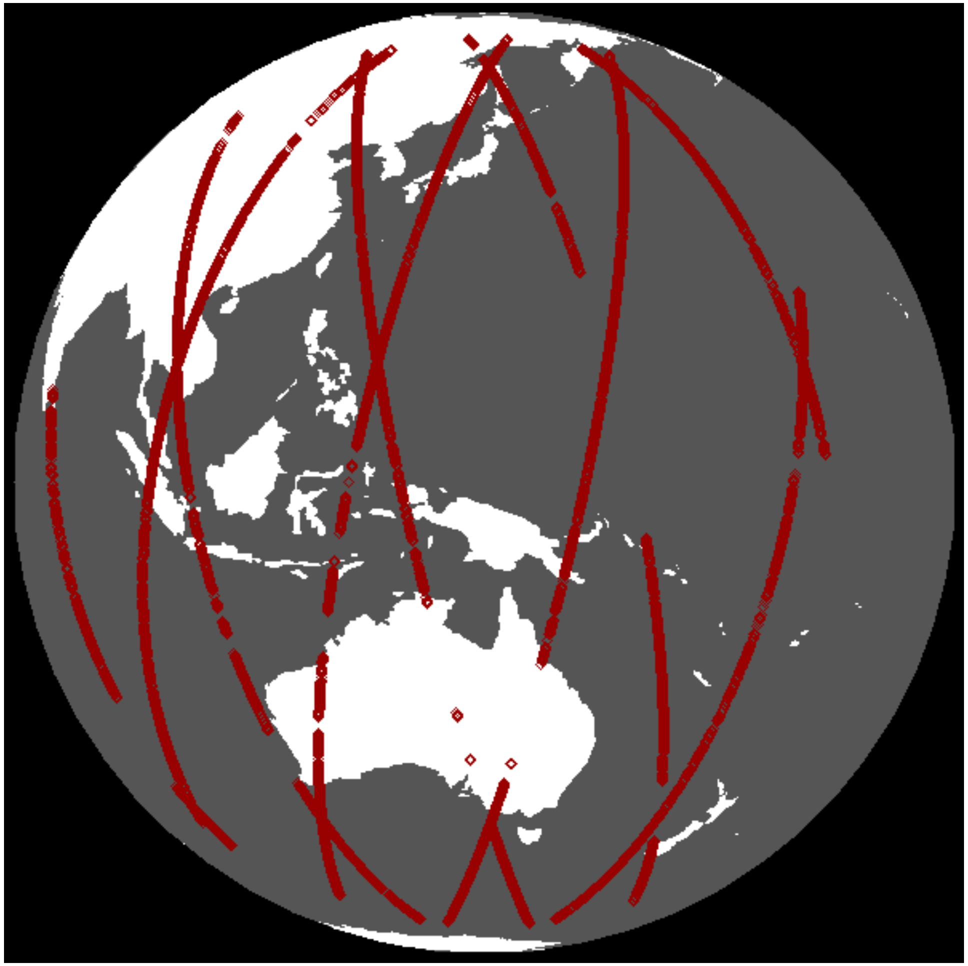


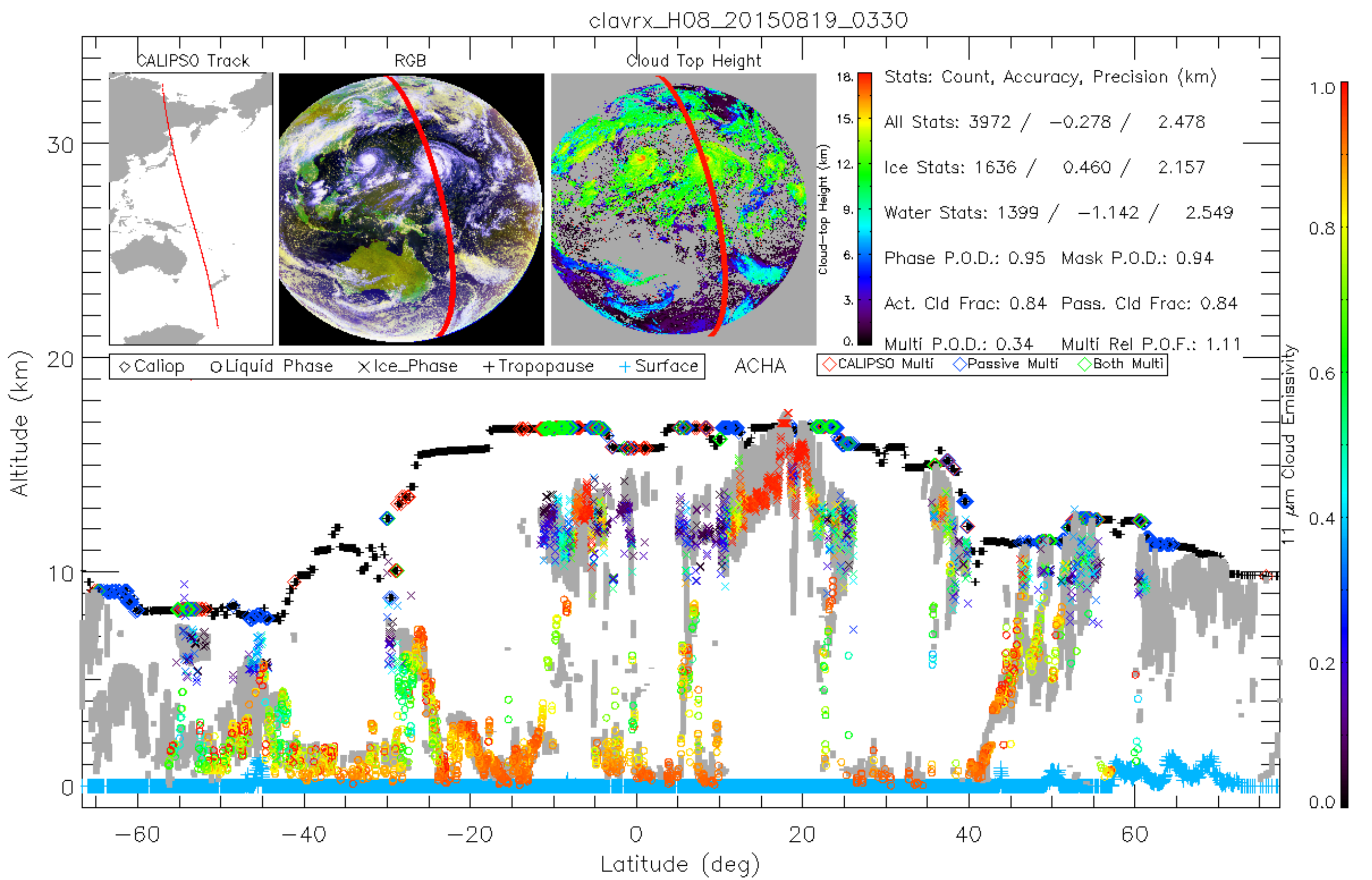
False Color Image

Red=0.65μm, Green = 0.86μm, Blue = 11μm (reversed)

Spatial Distribution of CALIPSO/AHI Matchups on August 19, 2016

- Red lines are the CALIPSO tracks.
- Orbital tracks with AHI viewing zenith angles > 70 omitted.
- Gaps in tracks are the clear CALIPSO results.





What ICWG data and analyses could/should be leveraged

Experiments & Data

- Experiment 1:
  - Derive AMVs from 11um image triplet
  - Use prescribed configuration (target box size, etc)
- Experiment 2
  - Derive AMVs from 11um image triplet
  - Each producer uses their own configuration

Datasets:

Imagery

Forecast data (ECMWF??)

ICWG Cloud datasets

Raob data

Other?

MISR CMVs

Identify & Analyze specific cloud scenes (cirrus, etc)???

Quality Indicator

AMV Provider	QI Implementation	QI Consistency Tests	QI Weights
BRZ	Single band, average interm. prod.	Forecast, height, temporal vector, and spatial vector.	FCST=1, Vector(T)=2, Vector(S)=2. Then, weighted average is multiplied by height to give the final QI.
CMA	Based on formula: $B_{m,k} = \frac{1}{6}\left[\left(\frac{U_m - U_{i,j}}{W_U}\right)^2 + \left(\frac{V_m - V_{i,j}}{W_V}\right)^2 + \left(\frac{T_m - T_{i,j}}{W_T}\right)^2 + \left(\frac{P_m - P_{i,j}}{W_P}\right)^2 + \left(\frac{S_m - S_{i,j}}{W_S}\right)^2 + \left(\frac{D_m - D_{i,j}}{W_D}\right)^2\right]$ where U,V : wind component (m/s) T: temperature (degree) P: pressure (hPa) S: wind speed (m/s) D: wind direction (degree) W: weights m: AMV index i,j: NWP grid index; interpolation of NWP data to AMV level, and selection of nearest index		

AREA	WEIGHTS					
	WU (m/s)	Wv (m/s)	Wt (℃)	Wp (hPa)	Ws (m/s)	Wd (o)
NH	4.1	3.8	10.0	150	4.0	30
TR	2.2	2.0	10.0	80	3.2	40
SH	3.6	3.0	10.0	150	4.2	25

AMV Provider	QI Implementation	QI Consistency Tests	QI Weights
EUM	Single band, average interm. prod	Forecast, height, temporal vector, and spatial vector.	FCST=1, Vector(T)=2, Vector(S)=2. Then, weighted average is multiplied by height to give the final QI.
JMA	Single band, second interm. prod.	Forecast, temporal vector, temporal direction, temporal speed, and spatial vector	FCST=1, Vector(T)=1 Direction(T)=1, Speed(T)=1, Vector(S)=2.
KMA	Single band, average interm. prod.	Forecast, temporal vector, temporal direction, temporal speed, and spatial vector.	FCST=1, Vector(T)=1, Vector(S)=1
NOA	All bands, one final QI.	Temporal vector, temporal direction, temporal speed, and spatial vector.	Vector(T)=1, Direction(T)=1, Speed(T)=1, Vector(S)=2
NWC	Single band, average interm. prod	Forecast, height, temporal vector, and spatial vector	FCST=1, Vector(T)=3, Vector(S)=3. Then, weighted average is multiplied by height to give the final QI.

Lesson Learned from 1rst AMV Intercomparison Study

The quality indicator remains the simplest, but efficient measure to screen out bad quality AMVs and to indicate consistency in the remaining winds. However, it would be beneficial if its implementation is revisited and unified across the AMV producing centers.

Taken from 2nd Intercomparison Study Report

"Common" QI desired

Draft Timeline

August 2016:	Finalize experiments to perform
September 2016:	Collect/post datasets*; software to read L1b data,
October/Nov 2016:	Providers can begin generating AMVs
June 2017:	Progress report to CGMS-45
November 2017:	Provides complete generation of datasets (enough time?)
December 2017:	Analysis of datasets begins (NWC SAF?)
June 2018:	Preliminary Results (at IWW14)?
October 2018:	Final report

ICWG members reprocessing golden day

Discussion

- Experiments
- What can we leverage
- Timeline