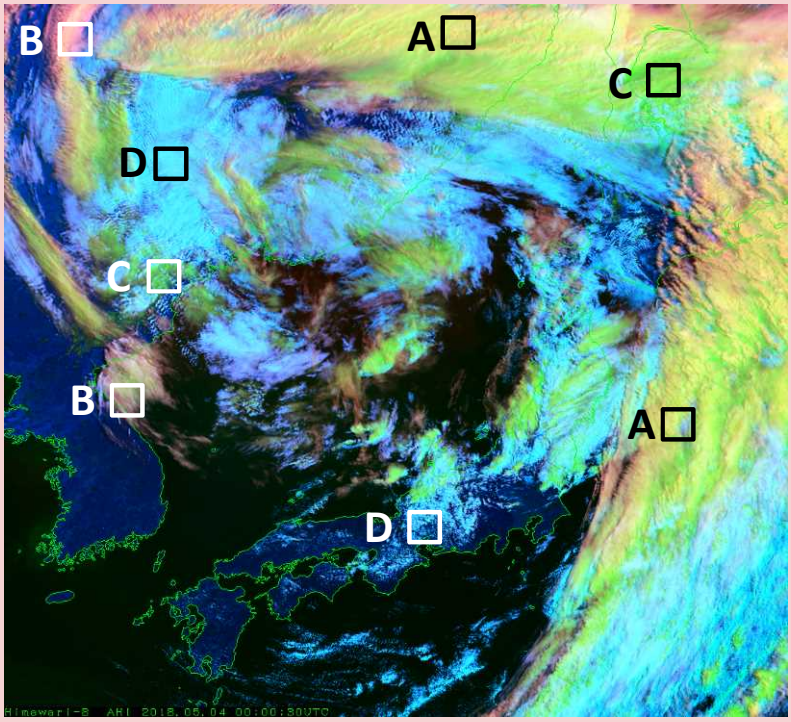
Meteorological Satellite Center (MSC) of JMA

Ver.1.0

Himawari Cloud Phase Distinction RGB Quick Guide



Cloud area with a low-pressure (polar-low) system around the Sea of Japan (00:00 UTC, 4 May 2018)

A : thick high-level clouds with ice particles
B : thin high-level clouds with ice particles ("B" in the lower part of the image corresponds to high-level lee cloudiness)
C : thick low-level ice clouds
D : thick low-level water clouds

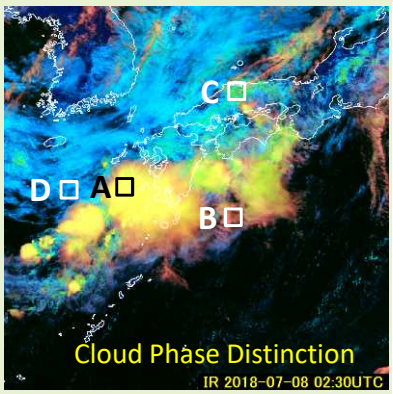
Main applications: Analysis of cloud thickness, cloud-top height and cloud phase

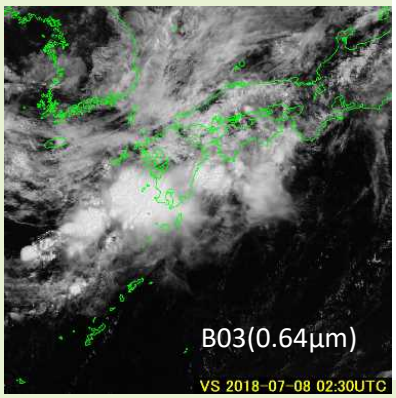
Benefits:

- Facilitation of determination between high-level ice clouds and low-level water clouds
- Facilitation of surface snow/ice identification

Limitations:

- Daytime availability only
- Effects on cloud/surface color due to thermal conditions (e.g., latitudinal, seasonal, diurnal)





Cloud area corresponding to the Baiu (Mei-yu) stationary front above western Japan (02:30 UTC, 8 July 2018)

Cloud analysis exclusively based on visible imagery (bottom) requires estimation with reference to cloud shapes and patterns. Thick clouds (Cbs) and low-level clouds can be identified at a glance from Day Cloud Phase RGB (top).

A : thick high-level clouds with ice particles
B : thin high-level clouds with ice particles
C : thick low-level ice clouds;
D : thick low-level water clouds

RGB composition with recommended thresholds and related specifications for Cloud Phase Distinction RGB

Color	AHI bands	Central wave length [μm]	Min [K/%]	Max [K/%]	Gamma	Physical relation to	Smaller contribution to signal of	Larger contribution to signal of
Red	B13	10.4	219.6K	280.7K	1.0	Cloud top temperature	Warm clouds	Cold clouds
Green	B03	0.64	0%	85%	1.0	Cloud optical thickness	Thin clouds	Thick clouds Snow-covered land Sea ice
Blue	B05	1.6	1%	50%	1.0	Cloud phase Snow and ice	Ice clouds	Water clouds

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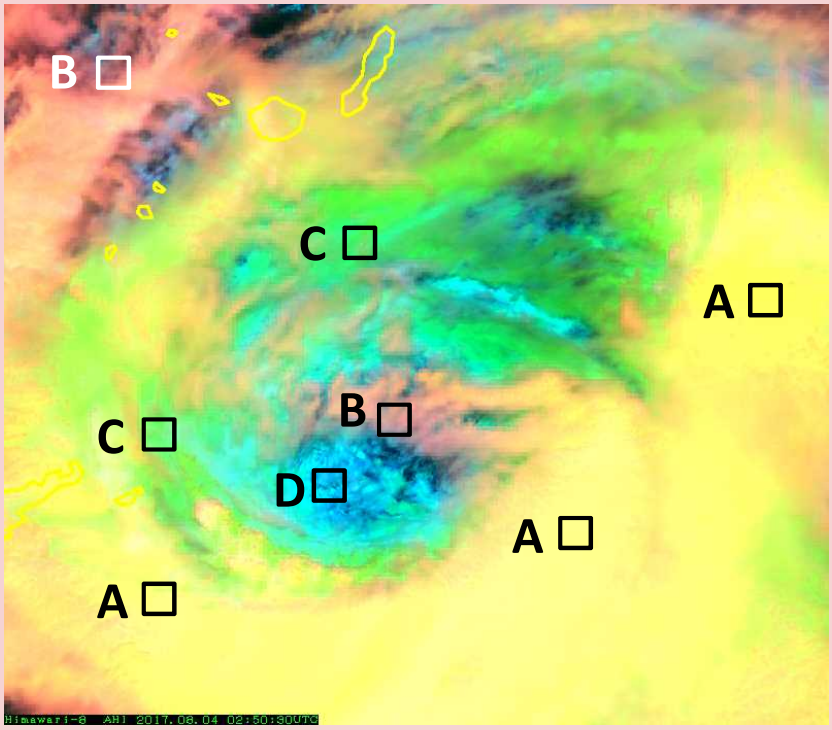
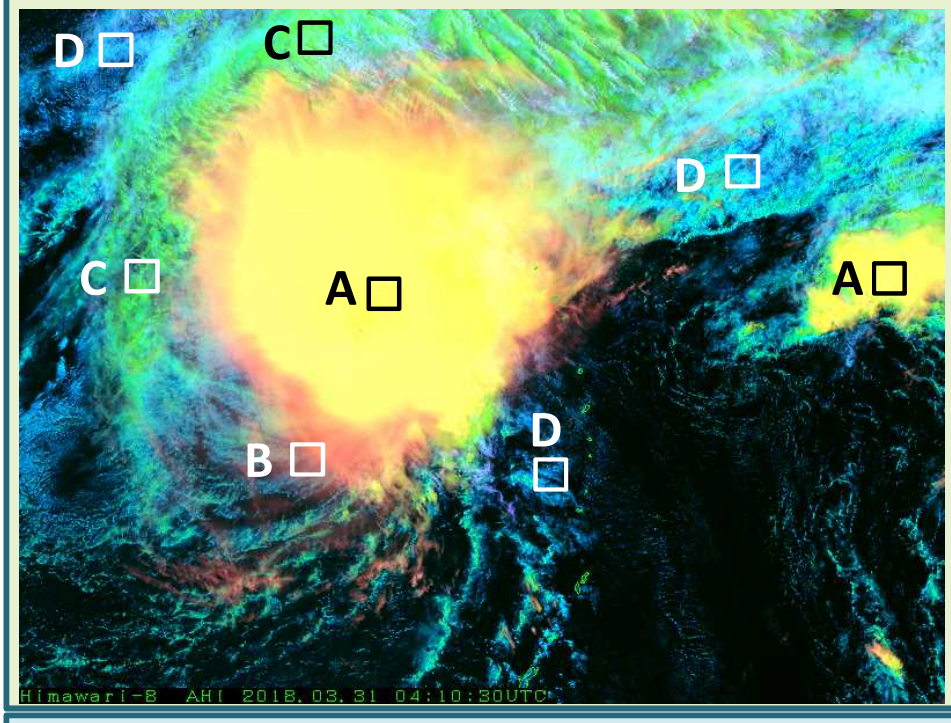
Typhoon Noru based on Cloud Phase Distinction RGB (02:50 UTC, 4 August 2017)

A detailed structure consisting of blueish low-level clouds (marked “D”) is seen inside the eyewall.

A : thick high-level clouds with ice particles
B : thin high-level clouds with ice particles
C : thick low-level ice clouds
D : thick low-level water clouds





Typhoon Jelawat (T1803) around the Mariana Islands (04:10 UTC, 31 March 2018)

Cb clouds (marked ”A”) with a thick high formation often appear in a saturated yellowish hue due to excessive emphasis on this RGB.
Here, bluish low-level clouds (marked ”D”) help to clarify and support evaluation of low-level movement.

A : thick high-level clouds with ice particles
B : thin high-level clouds with ice particles
C : thick low-level ice clouds
D : thick low-level water clouds

Color interpretation for Cloud Phase Distinction RGB

Color	Interpretation
	Thick high-level clouds with ice particles, Cb
	Thin high-level clouds with ice particles
	Thick low-level ice clouds Snow-/ice-covered area
	Thick low-level water clouds

Color interpretation may be developed in future work to enhance distinguishability.