SEVIRI HRV Cloud RGB
Quick Guide

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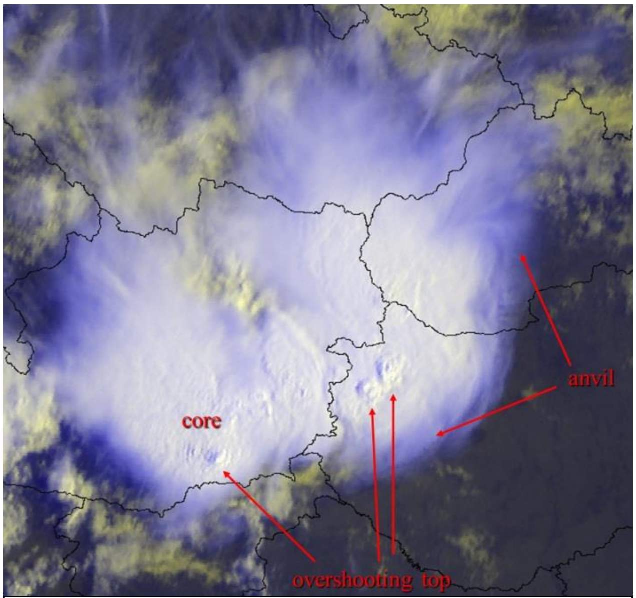
Aim: Monitoring of convection in high resolution.
It is useful for any other high-level cloud system monitoring (like fronts, cirrus) if high resolution is needed.
Area and time period of its main application: Low- and mid-latitude region, daytimes in convection season.
Applications and guidelines: This RGB type concentrates on *high cloud monitoring*. Thin and thick high clouds has good colour contrast from each other, from lower level clouds and cloud free region (including snow/ice). For convection monitoring *high temporal and spatial resolution* is needed: *animations of 5-minute HRV Cloud RGB images* are useful in combination with other products showing information on cloud top microphysics and/or cloud top temperature distribution (possible presence of cold U, cold ring features). Mature thunderstorm cloud top features like overshooting tops, gravity waves, ice plumes are well seen in this RGB due to the shadows and the high resolution. Intense (and/or long lived) overshooting tops, gravity waves, long lived cold U/V, cold rings are indicators of strong updraft thus possibly severity.



SEVIRI HRV Cloud RGB for 29 June 2006, 08:40 UTC

Background

The table shows which channels are used in the HRV Cloud RGB and lists some of the land and cloud features which have typically low or high contribution to the colour beams in this RGB. This is the most 'traditional RGB', as it is based on channels which were available already from Meteosat first generation satellites. HRV is used in two colour beams not too lose the high resolution.

Colour	Channel [µm]	Physically relates to	Smaller contribution to the signal	Larger contribution to the signal
Red	HRV	Cloud optical thickness Snow reflectivity	Thin clouds	**Thick clouds**
Green	HRV	Cloud optical thickness Snow reflectivity	Thin clouds	**Thick clouds**
Blue	IR10.8 inverted	Cloud top temperature Land/sea temperature	Warm cloud Warm land / sea	**Cold clouds**

Notation: HRV: High Resolution Visible channel, IR: infrared, number: central wavelength of the channel in µm. 'IR10.8 inverted' means that higher signals are assigned to cold brightness temperatures, while lower signals to warm brightness temperatures, like it is visualised as a single channel image.

Benefits

- Thin and thick high clouds has good colour contrast from each other. The semi-transparent part of the anvil and the thick storm core are well separated.
- High level clouds has good colour contrast against lower level clouds, and cloud free region (including snow/ice).
- Small size, developing (towering) cumulus clouds are earlier recognizable due to higher spatial resolution.
- Due to the higher spatial resolution one can better see the cloud top structure than in the 3 km resolution images.
  - Mature thunderstorm cloud top features like overshooting tops, gravity waves, ice plumes are better seen in this RGB due to the higher resolution.
  - The cloud top structure might provide useful information even in case of non-convective clouds. For example, low-level wave clouds, cloud streets are also better seen in higher spatial resolution. They give hint of the wind.
- This RGB is nice and easy to understand. It is very good for public.

Limitations

- It works only during daytime as it uses shortwave channel.
- Close to midday the cloud top features like overshooting tops, ice plumes, gravity waves are less seen than at low solar elevation.
- This RGB type concentrates on high cloud monitoring. It does not provide complex cloud analyses. The snow covered land, fog, low- and mid-level clouds appear in similar colours. It is not easy to distinguish them. Studying their form, structure, movement may help. Even better to use this RGB together with other types of images, for example, with Day Microphysics RGB.
- This RGB type combines only two channels, thus two types of information. It does not contain e.g. microphysical (phase, size) information.

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Interpretation

1 **Thick high clouds** (Bright greyish, whitish shades with shadows)

2 **Thin high level clouds** (Bluish shades depending on the transparency and the type of the underlying surface)

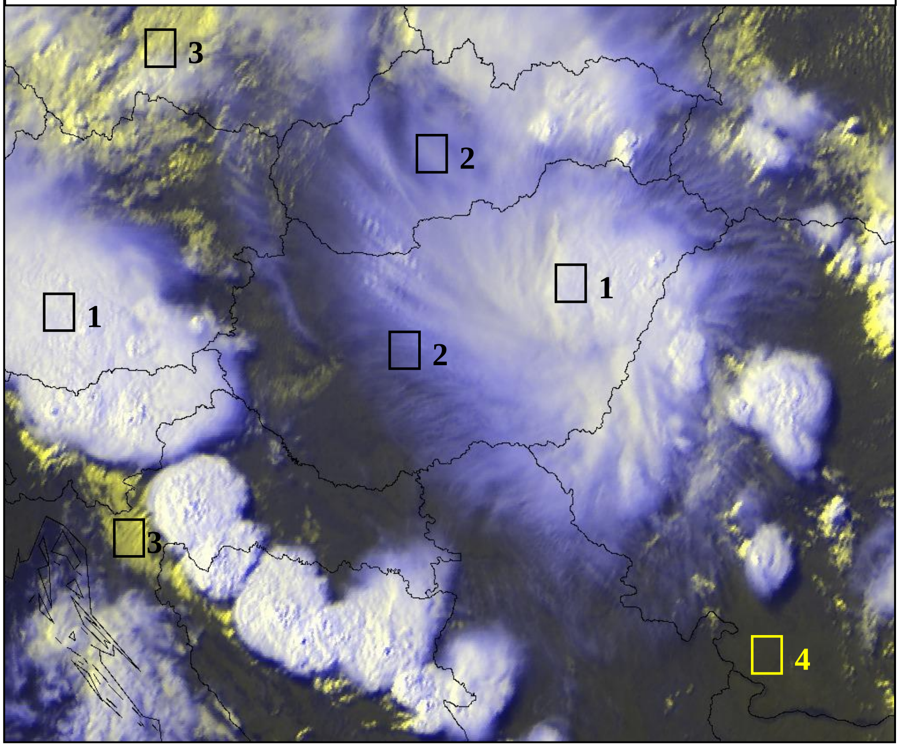
3 **Fog, low- and mid-level clouds or snow covered land** (Shades of yellow depending on the cloud top temperature, cloud thickness; temperature and state of the snow)

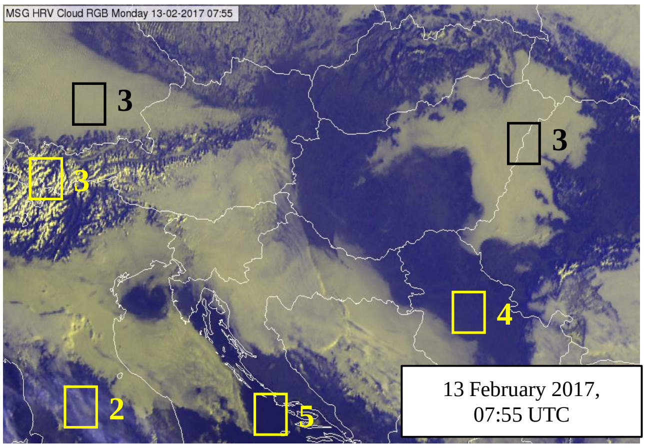
4 **Snow-free land** (Shades of grey with some bluish or yellowish tones depending on the temperature and surface reflectivity)

5 **Ice-free sea** (Shades of dark blue)

Colours depend also on the solar and satellite viewing angles.

SEVIRI HRV Cloud RGB for 29 June 2006, 15:10 UTC



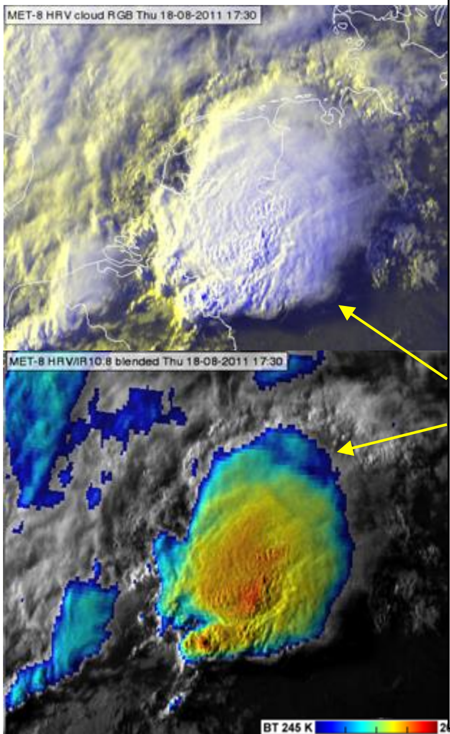


13 February 2017, 07:55 UTC

The HRV Cloud RGB is created following the EUMETSAT recommended recipe. Using different ranges and/or gamma corrections will modify the colours.

More about RGBs on EUMeTrain.org
Contact: info@eumetrain.org;

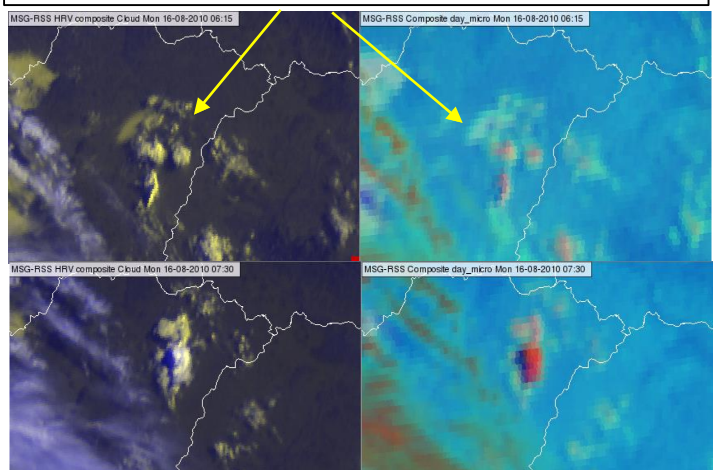
Comparison to other products



Both the HRV cloud RGB and the HRV/IR10.8 blended ('sandwich') image combine HRV with the IR10.8 channel data, but in different ways. The blended image is designed to study the cloud top temperature distribution and its collocation with other cloud top features of mature thunderstorms: collocation of cold U/V, cold ring with overshooting tops, ice plumes, gravity waves, etc. The sandwich product is better for thunderstorm top analyses, while the HRV Cloud RGB sees and identifies thin Cirrus better.

HRV Cloud RGB (up) and HRV/IR10.8 blended image (bottom) 18 August 2011, 17:30 UTC

The HRV Cloud and the Day Microphysics RGB rapid scan image sequences together is a good combination to monitor the convective initiation and development. As the cumulus clouds become colder their yellow colour turns to white in the HRV Cloud RGB images. In Day Microphysics RGB one can follow the glaciation of the cloud top as the cumulus clouds turn to red.



HRV Cloud RGB (left) and Day Microphysics RGB (right), 16 August 2010, 06:15 and 07:30 UTC