



True Color Images of the Earth created with the Geostationary Satellite Instrument MSG SEVIRI

Maximilian Reuter

University of Bremen, Institute of Environmental Physics, Bremen, Germany (reuterm@loz.de)

One of the most famous pictures ever taken was by the crew of Apollo 17 in 1972, showing our Earth from a distance of about 45000km. This picture was named 'Blue Marble' and it reminds us of the beauty and uniqueness of our home planet. With geostationary satellites, such views of the Earth are possible without the need to have a photographer in space. However, up to the present, the production of such Blue Marble type images from geostationary satellite data has been impaired by the lack of channels in the visible spectral region.

A method for the generation of full disk MSG (METEOSAT Second Generation) SEVIRI (Scanning-Enhanced Visible and Infrared Imager) true colour composite images will be presented. The algorithm mainly uses the SEVIRI channels VIS006 ($0.6\mu\text{m}$), NIR008 ($0.8\mu\text{m}$) and NIR016 ($1.6\mu\text{m}$). The lack of information in the blue and green parts of the visible spectrum is compensated by using data from NASA's (National Aeronautics and Space Administration's) Blue Marble next generation (BMNG) project to fill a look-up table (LUT) transforming RGB (red/green/blue) false colour composite images of VIS006/NIR008/NIR016 into true colour images. Tabulated radiative transfer calculations of a pure Rayleigh atmosphere are used to add an impression of Rayleigh scattering towards the sunlit horizon.

The resulting images satisfy naive expectations: clouds are white or transparent, vegetated surfaces are greenish, deserts are sandy-coloured, the ocean is dark blue to black and a narrow halo due to Rayleigh scattering is visible at the sunlit horizon. Therefore, such images are easily interpretable also for inexperienced users not familiar with the characteristics of typical MSG false colour composite images. The images can be used for scientific applications to illustrate specific meteorological conditions or for non-scientific purposes, for example, for raising awareness in the public of the Earth's worthiness of protection.