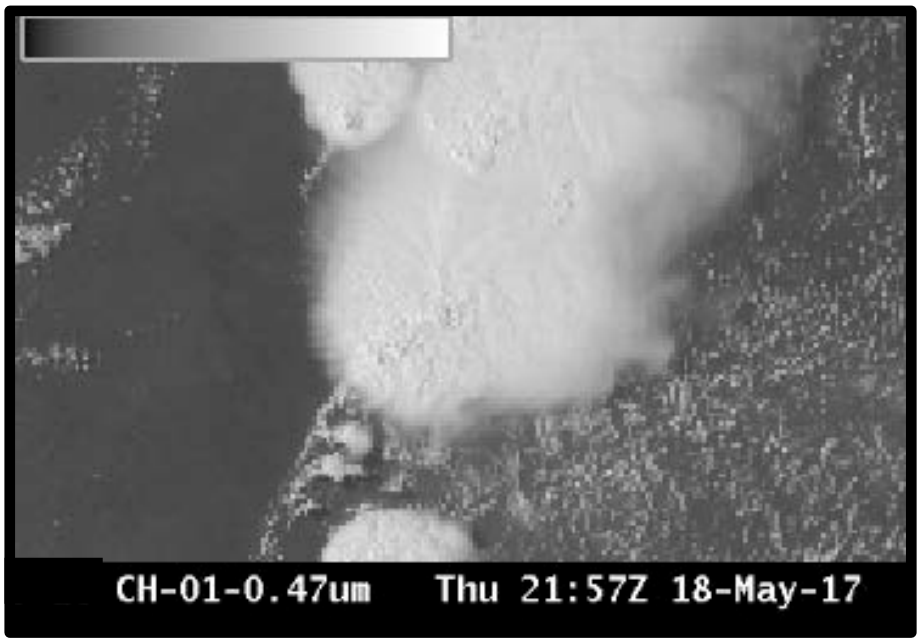
ABI Band 1 (0.47 µm) Quick Guide

Why is Blue Visible Band Imagery Important?

The 0.47 µm, or "Blue" visible band, is one of two visible bands on the ABI, and provides data for monitoring aerosols. Included on NASA's MODIS and Suomi NPP VIIRS instruments, this band provides well-established benefits. The geostationary ABI 0.47 µm band will provide nearly continuous daytime observations of dust, haze, smoke and clouds. The 0.47 µm band is more sensitive to aerosols / dust / smoke because it samples a part of the electromagnetic spectrum where clear-sky atmospheric scattering is important.



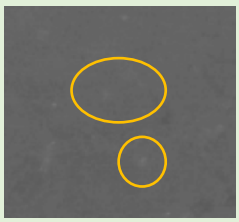
Comparison of ABI Visible Bands

ABI Band	Central Wavelength (µm)	Band Nickname	Type	Pixel Resolution at sub-satellite point
1	**0.47**	Blue	Visible	**1 km**
2	**0.64**	Red	Visible	**0.5 km**

Impact on Operations

Primary Application

Smoke and Aerosol: Highlight regions where visibility is reduced because of particulate matter. Faint smoke plumes at right are not visible in the "Red" band.



Input into Baseline Products: The 0.47 µm Blue band is a key component of the GOES-R Baseline Aerosol Products and Baseline Snow Products.

Input into RGB imagery: The Blue band, combined with a "Green" band simulated from the "Vegetation" band (0.86 µm) and the "Red" band (0.64 µm), will provide "natural color" imagery of the Earth.

Limitations

Daytime Only: The 0.47 µm band detects reflected visible solar radiation.

Scattering Angle Affects Dust/Smoke Signal: Smoke and dust are more effective forward scatterers than backward scatterers. Thus, the smoke and dust signals will be much more apparent when the Sun is low in the sky vs. high in the sky.

Scattering and the Blue Sky: Clear-sky Rayleigh Scattering is greater in the "Blue" Visible band part of the electromagnetic spectrum than in the "Red" Visible band part. This Rayleigh scattering causes the sky on Earth to be blue.

Contributors: Scott Lindstrom, Tim Schmit, Jordan Gerth UW-Madison/CIMSS August 2017

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Blue Band

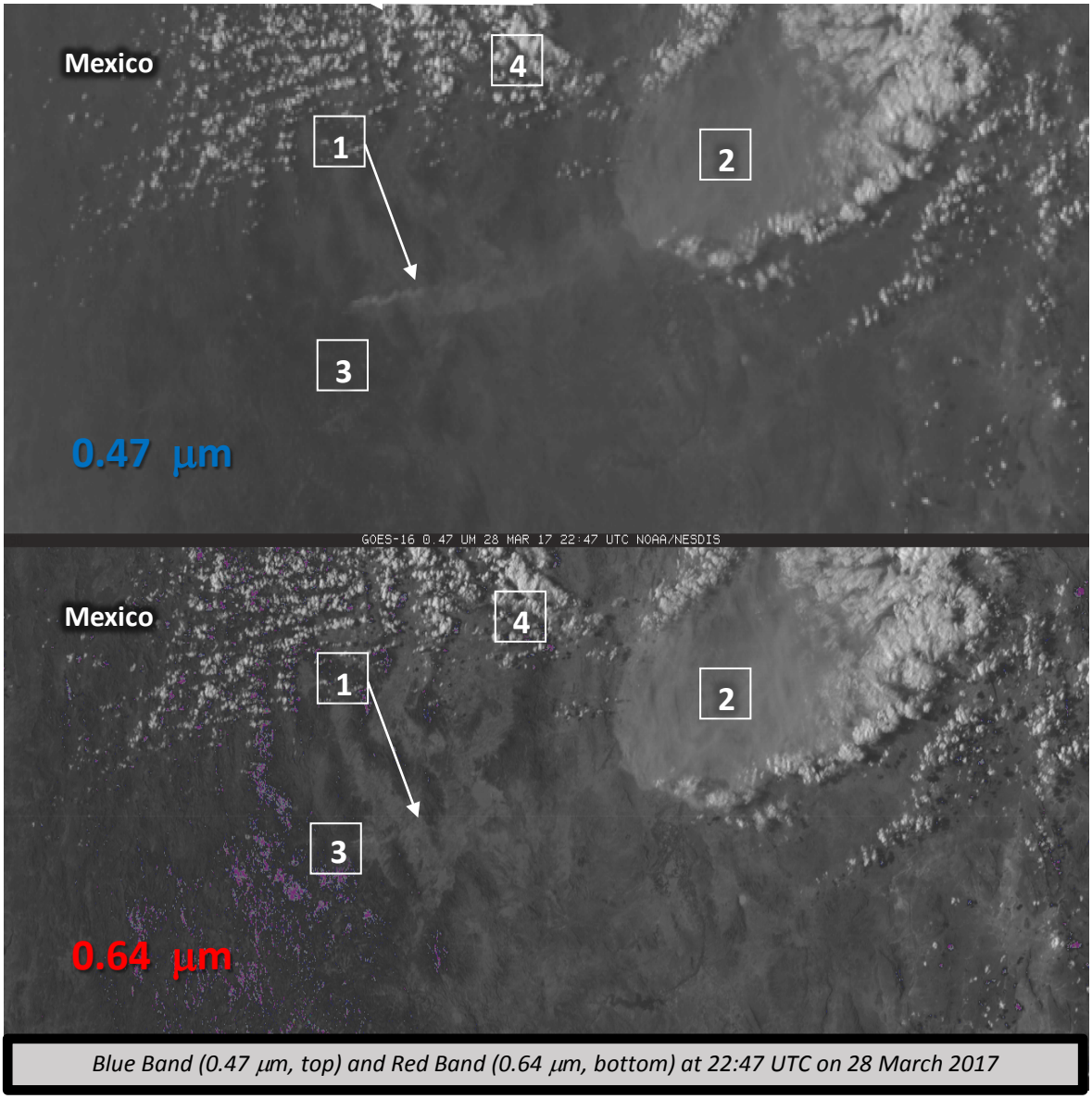
Image Interpretation

1 Smoke is very apparent in the Blue band, but not in the Red

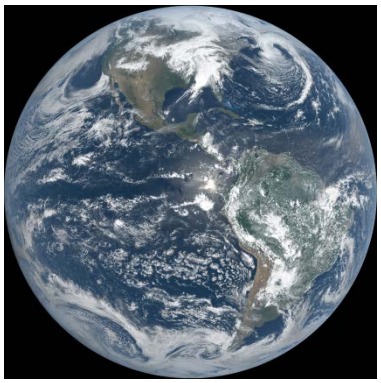
2 Thick dust is apparent in both bands

3 Surface Features show more distinctly in the Red band because of better spatial resolution in the Red and enhanced Rayleigh scattering in the Blue band

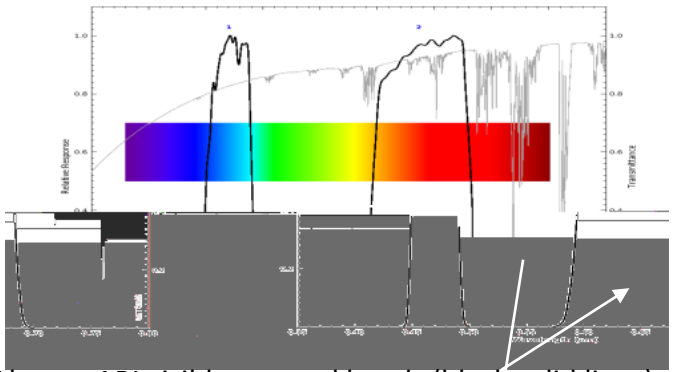
4 Clouds look similar in both Blue and Red bands.



Blue Band (0.47 µm, top) and Red Band (0.64 µm, bottom) at 22:47 UTC on 28 March 2017



The "natural" True Color image above, from CIMSS, was created using Blue, Red and Veggie bands. This image was not corrected for the Rayleigh Scattering that is present in the "Blue" band.



Above: ABI visible spectral bands (black solid lines) and atmospheric transmittance (grey line). There is decreased transmittance (increased scattering) at shorter wavelengths. (Credit: CIMSS and ASTER spectral library and Mat Gunshor)

Resources

BAMS Papers

Schmit et al.(2017).

Miller et al. (2016).

GOES-R.gov

Band 1 Fact Sheet

GOES-R Aerosol Products

These links do not work in AWIPS but they do in VLab