Joint Poster 2.2

GOES-R ABI Product Development
(Simulated Green and Simulated True-Color Imagery)

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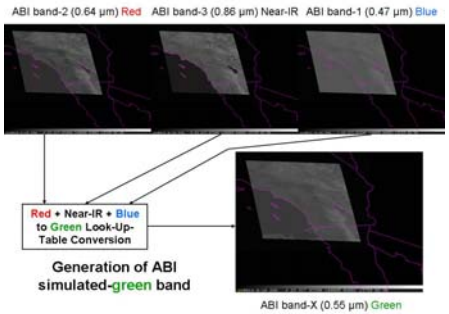
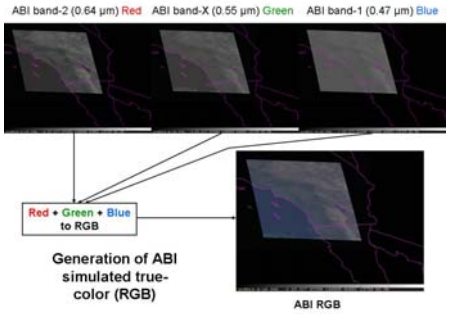
Abstract

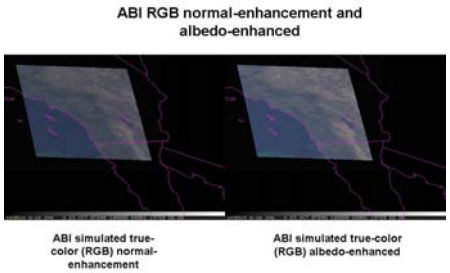
The current Geostationary Operational Environmental Satellite (GOES) series was inaugurated in 1994 with the launch of GOES-8 and will continue with two more satellites (GOES-O and P) past the most recent GOES-13 launched in 2006. The next generation GOES (beginning with GOES-R) will be launched in the 2015 time frame. The **Advanced Baseline Imager (ABI)** on this new series of satellites will include improved spatial, temporal, spectral, and radiometric resolution. The last two characteristics are manifest by an increased number of spectral bands and increased precision for measurements from those bands. Towards utilizing the extra/improved capabilities of GOES-R ABI, new products are being developed using proxy data from other satellites with some of the spectral bands that will be available on GOES-R.

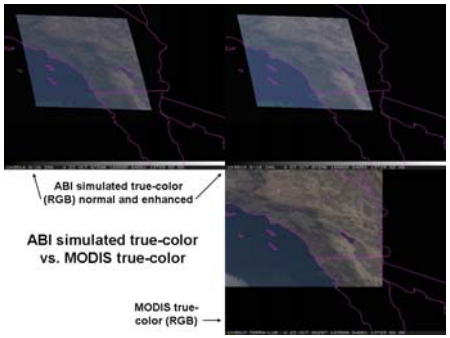
The simulations of ABI imagery for this work are aided by reflectances obtained from MODIS imagery. Those reflectances are used as surface albedos in forward-model radiative transfer simulations of the ABI visible and near-IR bands. (Simulations of other ABI reflective bands (1-6) and ABI emissive bands (7-16) have been accomplished in other efforts involving the generation of proxy datasets for the testing of fire detection algorithms. See related posters at this conference.)

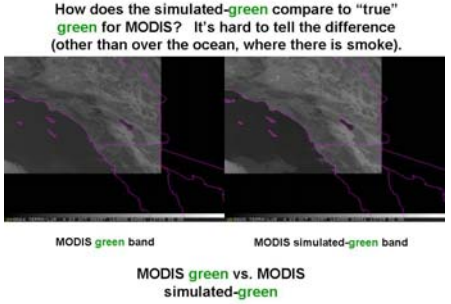
The focus of the work presented here is in the **generation of the "green" (0.55 µm) band for ABI**, a band that can be produced from the ABI Red, Near-IR, and Blue bands. The simulated green band allows simulated "**true-color" imagery** to be produced from ABI. The processes involved in the green-band and true-color imagery are explained in the accompanying panels.

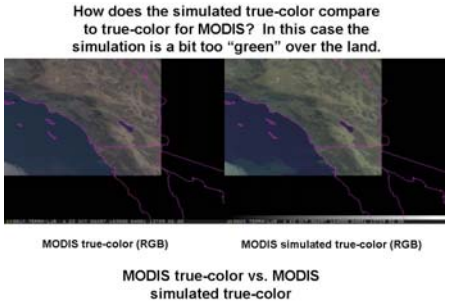


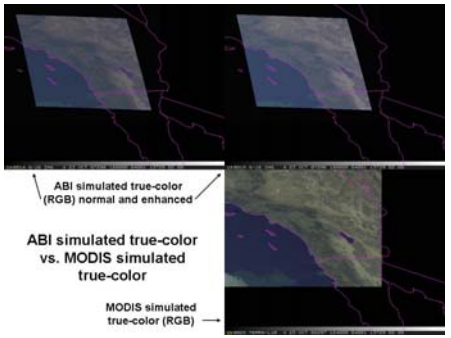












Reflectance statistics

Color	Wavelength	MODIS band	MODIS reflectance	ABI band	ABI reflectance
	(µm)		(average / maximum %)		(average / maximum %)
Blue	0.47	3	9.2 / 28.6	1	11.8 / 20.4
Red	0.64	1	8.7 / 35.4	2	7.3 / 19.8
Near-IR	0.86	2	11.6 / 39.3	3	8.2 / 22.0
Green	0.55	4	8.3 / 31.4	-	-
Simulated -green	0.55	X	9.7 / 39.6	X	8.4 / 18.7

Summary and Conclusions

The **generation of the "green" (0.55 µm) band for ABI**, a band that is not specified to be available on ABI, appears to be possible using statistics derived from MODIS imagery. Therefore, the generation of simulated **"true-color" imagery from ABI** also appears possible. The images presented are *preliminary* results that need refinement:

- There appears to be a green tint in the simulated-green for MODIS, where the simulated-green image can be compared directly with the actual MODIS green-band image.
- The reflectance statistics, comparing the equivalent MODIS and ABI bands, indicate that the relative ratios of the reflectances among the (red, green and blue) bands are not correct, nor are the maximum reflectances.
- The ABI simulations appear to be more "washed out", possibly due to excess scattering in the forward-model simulations.

Therefore, work continues towards refining the simulated green-band and simulated true-color images for ABI.

In work to follow, and based on other work with three-color image combinations, the green band and related true-color images may prove to be useful image products for the detection of certain atmospheric and surface features, such as smoke, dust, and volcanic ash.

References

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