Subject: Re: MODIS L1B - 250m
Posted by James Kuyper on Tue, 12 Mar 2002 16:52:23 GMT
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Thomas Ohde wrote:

> We want to use Level 1B Calibrated Radiances 0.25km data (MOD02QKM) of
> http://acdisx.gsfc.nasa.gov/data/dataset/MODIS for our research in the
> Baltic Sea, but we had a striping with mismatch in the coast line (bow-tie
> effect).
>
> Are there any software in IDL or ENVI for the correction of the MODIS
> LEVEL-1A data?

Maybe I'm just being defensive, because it implies that there was an error in my geolocation code, but I don't think "correction" is the right term. The radiances you see are, to the accuracy of the L1B calibration, the correct radiances. The specified locations are, to about 50m accuracy, the correct ground locations from which those radiances were collected. The bow-tie effect is a real characteristic of the way the data was collected, not an error that needs correction. I apologize if I sound a bit defensive about this.

Liam Gumley has written some code for correctly displaying MODIS image data, try <ftp://origin.ssec.wisc.edu/pub/MODIS/IDL/>.

The best way to handle the butterfly effect in MODIS image data is to treat each scan of data (which corresponds to 40 consecutive scan lines, at 250m resolution) as a seperate image, 10 km wide at the center, 20km wide at the outer edges, and a few thousand kilometers long. Each such image will overlap the preceeding and following image. Create each image seperately, and then decide how you want to handle the overlaps. Averaging in the overlap region is best, but it's quicker to just let later scans overwrite parts of the image that were filled in by the earlier scans.

Note: the satellite's altitude above the ground varies slightly. It sometime flies low enough that there are actually gaps between scans near the center of the scans. It sometimes flies high enough that as many as three different scans of data overlap the same ground position, near the outer edges of the scans.

That's just in normal operations; when the spacecraft is flying with a yaw near 90 degrees, as many as a hundred scans of data can overlap at the same point; I was called in once to help resolve a problem caused by this. It turned out that they were trying to process MODIS geolocation data during a maneuver, and they were using an algorithm that kept track of the overlaps in fixed sized arrays that allowed for a maximum of 10

overlaps. They weren't really interested in processing the maneuver data, they just hadn't bothered to check.

Please note that you must NOT interpolate the geolocation data across scan boundaries. Just last week I got a complaint from someone about the accuracy of our geolocation code; it turned out that he had made precisely that mistake. The resulting pictures had bizarre ripples of distortion running across them, at the boundaries between successive scans. You can interpolate within a scan, but since the geolocation data is at 1km resolution, you'll have to extrapolate it at the edges of each scan when displaying 250m data.
