Subject: Re: Routine for Converting DN to Radiance to Temperature
Posted by Conor on Fri, 27 Jul 2007 12:30:00 GMT
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On Jul 26, 5:12 pm, Marsh...@gmu.edu wrote:
> Hi dears:
> Can someone help me how to write routine for converting Digital Number
> to Radiance to Temperature for MASTER bands (HDF format) in IDL?
>
> Best Regards,

I think you'll have to be much more specific if you want some help.
In particular, we don't all have the same science background as you.
Since not everyone here knows how to convert DNs to radiance to
temperture in general, we certainly can't help you do it in IDL.
Provide a little background and someone might be able to help though...

Subject: Re: Routine for Converting DN to Radiance to Temperature
Posted by Paul Van Delst[1] on Fri, 27 Jul 2007 16:52:57 GMT
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Hello,

Working from scratch, the user will have to be *much* more specific. The questions that immediately occurred to me were not all language related. Does the OP have the necessary calibration data for the instrument for the time that they want to calibrate the earth-viewing data? If they do, do they have the documentation stating how to use that data to convert the digital counts into physical radiances? Do you also have the channel frequencies and polychromatic correction coefficients to do the conversion from radiances to temperatures? If not, do you have the channel spectral response functions so you can derive them? Once all those sorts of ducks are lined up, the language one chooses to use to write the calibration+conversion routines in is mostly for convenience.

But, given that the MASTER instrument has been used pretty extensively,

http://master.jpl.nasa.gov/

I'd be quite amazed if the data released to the public, or even researchers, wasn't already calibrated. Instrument scientists are usually *extremely* picky about their instrument's calibration.

At any rate, a better place to ask the original question is via the MASTER page above (and they even have links to ENVI and IDL software to read the hdf datafiles!).

cheers,

paulv

--
Paul van Delst Ride lots.
CIMSS @ NOAA/NCEP/EMC Eddy Merckx

Subject: Re: Routine for Converting DN to Radiance to Temperature
Posted by James Kuyper on Fri, 27 Jul 2007 22:08:02 GMT
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Paul van Delst wrote:
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Following that link, I learned that MASTER data is stored in the same format as MAS data, and the format is documented at <http://mas.arc.nasa.gov/reference/hdfread.txt>. The CalibratedData SDS has an SDS attribute named "scale_factor" which is a 50 element array, and another one named "units" with a value of "watts/meter2/steradian/micron". The middle dimension of the CalibratedData array is also 50, which appears to be the number of bands of data. Therefore, I'd hazard a guess that, in order to obtain a value with those units for a given band, you just calculate:

radiance = CalibratedData[*,band,*]*scale_factor[band]

The file specification has many references to temperatures, but they

look like instrument temperatures, whereas I suspect you're interested in the brightness temperature. However, if you know what the brightness temperature is, you should know how to calculate it from the radiance.

If you need help reading HDF data, look in the IDL online help for HDF_SD_Start()/HDF_SD_Close, HDF_SD_NameToIndex(), HDF_SD_Select()/ HDF_SD_EndAccess, HDF_SD_GetData, HDF_SD_AttrFind(), and HDF_SD_AttrInfo().
