Subject: Re: IDL/ENVI SPOT-5 Level 1a (DIMAP format) - simple(?) gain problem
Posted by D2 on Mon, 23 Aug 2010 22:16:02 GMT
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On Aug 23, 4:58 pm, Maxwell Peck <maxjp...@gmail.com> wrote:
> On Aug 24, 4:44 am, D2 <dennis.d...@gmail.com> wrote:
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>
>> On Aug 23, 12:53 pm, "Jeff N." <jeffnettles4...@gmail.com> wrote:
>
>>> On Aug 22, 5:15 pm, Maxwell Peck <maxjp...@gmail.com> wrote:
>
>>>> On Aug 23, 2:31 am, D2 <dennis.d...@gmail.com> wrote:
>
>>>> > Hi all,
>
>>>> > It's a Sunday afternoon and I'm pulling my hair out trying to do
>>>> > something I thought was going to be relatively easy, but instead has
>>>> > turned into a bit of a nightmare for a beginner at IDL/ENVI.
>
>>>> > I've got a geotiff of SPOT-5 level 1a imagery that I bring in by
>>>> > opening up the supplied *.DIM file so that I get most of the important
>>>> > metadata (e.g., band wavelengths, standard gains and offsets, etc).
>
>>>> > So, the question is this: how can I apply separate gains and offsets
>>>> > to each of my 4-bands, and then write those new results together into
>>>> > a separate file, or even the original file? In other words, the
>>>> > original file + 4 new "bands" added to it, or new file (with all
>>>> > projection metadata, etc. intact) with 4 new band).
>
>>>> > The original file is in 8bit "digital number" (aren't they all
>>>> > "digital"?? heh.) and I'm calculating 32-bit floating point values, so
>>>> > it's your standard "radiometric calibration" process.
>
>>>> > I've tried using the "apply gain and offsets" module, but that
>>>> > multiples when I want to divide values. I've also tried using band
>>>> > math, but I seem to be only able to apply one equation to one band at
>>>> > a time, and then it only outputs the results to a single file. I'd
>>>> > like to apply 4 separate equations to their respective bands, and then
>>>> > output these new results to a single file, or just write them into the
>>>> > original file.
>
>>>> > There's a user submitted code on the ENVI user forum that basically
>>>> > does what I need to do (calibrate_spot.sav), but I'd like to get under
>>>> > the hood to tweak parameters and begin to teach myself to understand
>>>> > IDL. What I'm looking to do is apply my own custom gains and offsets
>>>> > instead of using those supplied in the metadata file.

>
>>>> > I do want to learn, and I'm eagerly awaiting my Morton Canty book to
>>>> > arrive, but I'd like to make some headway on this now.
>
>>>> > Any pointers (and sample code) would be immensely appreciated!
>
>>>> > Cheers,
>
>>>> > Dennis
>
>>>> From memory the gain/offset routine applies them in the 'remote
>>>> sensing' sense, that is GAIN* (DN - OFFSET) . If you adjust your
>>>> offset accordingly the routines will do what you want.
>
>>> I've used envi's gain/offset very little, and a long time ago at that,
>>> so i could be wrong but i think that that routine applies the same
>>> gain/offset to every band, and the OP mentioned a different gain/
>>> offset for every band.
>
>>> Assuming that's the case, what I would do is assemble all the gain's
>>> into a "spectrum" (a linear array with one element per band containing
>>> all the gains), and then do the same thing for the offsets. From that
>>> point what you'd want to do is actually spectral math:
>
>>> s1*s2+s3 ;adjust equation as you need to
>
>>> where:
>
>>> s1 - input file (use "Map variable to input file" button)
>>> s2 - gain "spectrum"
>>> s3 - offset "spectrum"
>
>>> Of course, if you were going to be doing this several times, and have
>>> ENVI+IDL, i'd just write code to do this.
>
>>> Jeff
>
>> Thanks Jeff. Much appreciated.
>
>> Originally, I wanted to use the the gain/offset module as it outputs
>> the calculated bands into a single file, but I don't think there's a
>> way of reusing it to meet my needs. It calculates TOA radiance (and
>> applies separate gains and offsets to each band) like so:
>
>> TOA Radiance = (DN*GAIN)-offset
>
>> but I need:
>

>> TOA Radiance = (DN/GAIN)-offset
>
>> However, your solution does provide me with an option, so thanks for
>> that. I'd like to program it all in IDL, but I'm a complete beginner.
>> Thankfully, my "Practical IDL Programming" book has just arrived, so
>> hopefully there will be some tips in there.
>
>> Let me know if you have any suggestions/caveats about how to use ENVI
>> specific functions to accomplish this (I'm still waiting for my Morton
>> Canty ENVI//IDL book to arrive).
>
>> Thanks again!
>
>> Dennis
>
> You can definitely use the gain/offsets differently on each band. 1/
> GAIN might be useful ??

So elegant (and obvious), I didn't pick it up the first time you
suggested it. Thanks Maxwell!!
