Subject: Re: Convolve a spectrum (from MODTRAN) with a spectral response function
Posted by Mat on Mon, 18 Jan 2010 21:51:20 GMT
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On Jan 5, 11:39 am, Paul van Delst <paul.vande...@noaa.gov> wrote:
> Your SRF (spectral response function) seems to only increase (looks like only half an
> SRF?), and your computed radiances do not span the bit of SRF that you do have.
>
> Also, in that part of the IR spectrum you have some water vapour line absorption
> contamination so I would be suspect of a convolution at such a coarse resolution - I would
> think you would have a bias that varies with the column water amount in your MODTRAN calc.
> Easy enough to determine - just plot the convolved result as a function of TPW for a
> couple hundred(or thousand) profiles.
>
> I would start by doing the radiative transfer calc at a finer resolution and linearly
> interpolating the results to the same frequency spacing as the SRF. Then it's just a case of
>
> Convolved_Radiance = TOTAL(Interpolated_Radiance*SRF,/DOUBLE)
>
> You could do a "proper" convolution using INT_TABULATED or CONVOL, but given the paucity
> of your dataset, a simple summation is the better option IMO.
>
> At least in the case of INT_TABULATED, I know from experience it does not (cannot) perform
> well for too few SRF data points as it uses spline interpolation.
>
> I reckon the FFT approach is overkill here - and you would have to interpolated the SRF to
> do it... again, not a good idea due to the lack of data.
>
> cheers,
>
> paulv
>
>
>
> Mat wrote:
>> On Dec 30, 4:41 pm, Mat <m...@waikato.ac.nz> wrote:
>
>> Sorry I will try again!
>
>> Hi all
>
>> I would like to convolve a spectrum (output from MODTRAN) with a
>> spectral response curve (Landsat7 B62) and then integrate the
>> convoluted result. As you can see from the example below the spectral
>> resolution does not match.
>
>> Eg. Spectrum:

>
>> Wavenumber Radiance
>> 800.0 7.52E-004
>> 801.0 7.66E-004
>> 802.0 7.58E-004
>> 803.0 7.25E-004
>> 804.0 7.23E-004
>> 805.0 7.62E-004
>
>> Eg. Response
>
>> Wavenuber Relative Spectral response
>> 800.00000 0.2
>> 800.64051 0.29
>> 801.28205 0.27
>> 801.92462 0.28
>> 802.56822 0.36
>> 803.21285 0.36
>> 803.85852 0.39
>> 804.50523 0.41
>> 805.15298 0.42
>> 805.80177 0.43
>> 806.45161 0.45
>
>> Any help would be much appreciated.- Hide quoted text -
>
> - Show quoted text -

Thanks to all who replied. Yes I did not need convolve, just interpol
and simple multiplication as paulv suggested.
