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Geoscientific Instrumentation Methods and Data Systems Discussions

# *Interactive comment on* "Radiometric flight results from the HyperSpectral Imager for Climate Science (HySICS)" *by* Greg Kopp et al.

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Thank you very much for your helpful comments, and I very much appreciate your careful reading of the article!

Addressing each of your points:

1) We will add a schematic of the instrument optical layout. That's a good idea. I've currently left a placeholder for the figure for when we get it completed.

2) Opps – thanks! It's done.

3) I've added a paragraph to the end of 4.3.2 to mention this. It offers a verification method under actual observation conditions, which could be helpful for an on-orbit



instrument.

4) Figure 4 shows the actual diattenuation measurements and the resulting model based on them. The measurements themselves do not extend above 1600 nm, therefore I only showed the spectral scale going that far (rather than compress the results by adding blank space to the plot at longer wavelengths).

5) Containing both Hg & Ar, this pen-ray lamp does provide spectral lines through the SWIR too. In the paper's comments section, we've attached a supplemental plot of the measured spectrum from this lamp, showing several lines in the NIR. The signals are higher than you might expect, being weighted by the HySICS-instrument efficiencies, which are also higher in the NIR. (This plot is more just to satisfy your curiosity, but isn't something I think worth adding to the paper itself.)

6) The multiple image-acquisitions and the dual-scan approach we mention needs to be done at the time of the observations; it's not merely a ground-based post-processing step. The dual-scan approach relies on doing two consecutive scans of the Sun (or Moon) using different FPA integration times for each, such that a short integration-time scan contains unsaturated data (for obtaining the signals from spectral regions having high instrument-efficiency and signal) and the second scan having longer integration times to increase the signals from low-efficiency spectral regions. The flat fields can then be obtained in the separate spectral regions using the dual-scan images appropriate for each region. This approach could lower flat-field uncertainties had we performed it during the flight. (In the current analysis, we have already benefitted from reducing uncertainties via any multiple, redundant images acquired, but we can't retroactively acquire data with the long and the short integration-times.)

Thanks again for the good comments!

Greg

Please also note the supplement to this comment:

http://www.geosci-instrum-method-data-syst-discuss.net/gi-2016-37/gi-2016-37-AC1-supplement.pdf

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