

## ***Interactive comment on “Validation of OSIRIS mesospheric temperatures using satellite and ground-based measurements” by P. E. Sheese et al.***

### **Anonymous Referee #2**

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This manuscript describes the measurement of atmospheric density and the retrieval of mesospheric temperature profiles from the OSIRIS satellite instrument. Examples of comparisons with other measurement methods provide confidence that the retrieved profiles are reasonably accurate and representative. I have a few questions and some suggestions that, I think, can improve the report, if they are considered.

Title: Recommend saying “Assessment of the quality of . . .” instead of “Validation of” because only the PCL measurement is really “a truth measurement”. But as you note, the OSIRIS data do not coincide well in time with the PCL data.

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(Section 1, Introduction): The work of Clancy and Rusch (JGR, 1989) offers a useful perspective of early satellite efforts to provide the distribution of temperature in the mesosphere.

lines 44-45: A measurement vertical field of view of 1 km narrows the vertical resolution of the retrieved T, but does equate to it. And your vertical sampling rate is only every 1.5 km.

line 99-101: Stevens et al. is in press at JGR and describes SOFIE v1.2 and 1.03, not v1.1. Above 88 km SOFIE T is significantly warmer than OSIRIS values. Refer to Marshall et al. (AMT, 2011) for SOFIE error estimates throughout the mesosphere.

(Section 2, OSIRIS temperatures), line 113: Part of the uncertainty about the O<sub>2</sub> density profile must come from knowledge of the vertical alignment of the VER profile, which has a registration uncertainty of 0.5 km. In the extreme how would your T(z) be affected, if the measured altitudes were incorrect by 1 km? Your estimate for 0.5 km should part of your error budget for Table 1.

(Section 3, Results), line 205: You need to understand the nature and causes of the outliers, too.

line 244: A high bias of 2K for OS versus SABER agrees nicely with the stated finding on line 96 that the SABER (version ?) temperatures are cold by 2 K in mesosphere.

Figure 5: Bias at the stratopause is large and significant at high latitudes of the SH. Any thought about why? Scatter from high surface albedo or another reason?

line 262: Please summarize here the probable reasons for this disagreement.

line 287: I suggest saying “a much colder bias” rather than “lower bias”.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 5493, 2012.

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