

Interactive comment on “Satellite measurements of the global mesospheric sodium layer” by Z. Y. Fan et al.

Anonymous Referee #3

Received and published: 16 May 2007

The paper of Fan et al. describes a comprehensive and unique data set of sodium density measurements by the ODIN/OSIRIS satellite instrument. The data provide a near global distribution and allow retrieving latitudinal and seasonal differences. The manuscript is in most parts concise and comprehensive and should be published after only minor changes.

Minor comments:

p. 5421, ll. 27-29: I do not see the increase of FWHM by more than a factor of 2 from summer to winter, neither in mid latitudes nor in polar latitudes. There is about a factor of 2 increase in summer between high and mid latitudes, but I assume that this is not meant. Additionally, the dynamic range of the colour bar in Fig. 4 is just a factor of 2.

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By this, larger increases can not be identified directly.

Another interesting information in Fig. 4 should be mentioned and discussed: The latitudinal variation of FWHM vanishes in September/October and is very small in March/April. On the other hand the FWHM in Jan-Jul is at all latitudes about 2 km larger compared to the other months (with the exception of the south polar summer), providing some evidence for annual variation with remarkably constant phase. Therefore the authors should explain why the FWHM in the northern hemisphere spring is about 2 km larger than in the southern hemisphere spring.

Technical comments:

p. 5416, ll. 3/4: chemilumiscient should be replaced with chemiluminescent.

p. 5422, l. 18: The vertical wind maximum is slightly asymmetric to the south, so the given altitudes should be adjusted. This asymmetry might be related with the asymmetric morning depletion of Na, which is presented in Fig. 5 and l. 12.

p. 5424, ll. 11/12: The reference should read “Lübken and Höffner, 2004”. Please correct also this item in the reference list.

p. 5425, l. 23 to p. 5429, l. 12: There are several typos etc. in the reference list. The authors should carefully check the complete list for typos, capitalisation, commas,... Some of them are listed below. I further suggest to provide the full list of authors names (according to ACP recommendations) and to avoid the “et al.”, if less than 10 co-authors contributed to the paper.

p. 5426, l. 10: The author list should end with “... and Takahashi, H.”

p. 5426, l. 13: From the name of P.P. Batista only the first initials are given.

p. 5436, ll. 25-29: The order of the Gardner et al. papers should be chronologically.

p. 5427, ll. 7-11: The order should be Hunten (1954), Hunten (1967), Hunten et al. (1964). Within the Hunten (1967) reference the year should be shifted to the end.

p. 5428, ll. 7-19: The order of the Plane and Plane et al. paper should be corrected. The Plane et al. (1998a) and (1998b) are identical references. The year of Plane et al., JGR, vol. 104 should read 1999.

p. 5428, l. 29 to p. 5430, l. 1: The order of the She et al. papers should be chronologically.

p. 5429, l. 8: The authors of von Zahn et al. (1988) are U. von Zahn, G. Hansen and H. Kurzawa.

p. 5431, Fig. 2: MSISE-00 should read NRLMSISE-00.

p. 5432, Fig. 3: MSISE-00 should read NRLMSISE-00.

p. 5433, Fig. 4: The numbers of profiles given in the grid boxes differ slightly from the numbers given in Fig. 1. It should be explained, why only a subset of the observations is used for this Figure.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 5413, 2007.

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