

## ***Interactive comment on “First space-borne measurements of the altitude distribution of mesospheric magnesium species” by M. Scharringhausen et al.***

**M. Scharringhausen et al.**

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Interactive comment on &#8220;First space-borne measurements of the altitude distribution of mesospheric magnesium species&#8221; by M. Scharringhausen et al. Anonymous Referee #4 Received and published: 1 October 2007

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NOTE: Author's responses are denoted by '####>'

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The paper by Scharringhausen describes observations of mesospheric Mg and Mg+ made by the SCIAMACHY instrument on the ENVISAT satellite. The authors obtain

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the first profiles for mesospheric Mg and Mg+ obtained from satellite observations. The authors describe the observations and in some detail their processes and algorithms for obtaining Mg and Mg+ profiles from those observations. The authors describe their retrieval process in great detail. I studied the development of their equations thoroughly. Similar algorithms have been published in the past and there could be some argument that such a level of detail is not required for the present paper. However I feel the authors have done an excellent job of describing the algorithms and with the exception of a few minor comments below, I feel it is very worthy for publication. My only concern is that the uncertainties in the data may not warrant such a sophisticated treatment. Figures 25 and 27 suggest that there are only 2 points in each profile where a reasonable number density is truly obtained. Below these altitudes the uncertainties are such that the results do not appear useful. While I think the results should be published, I believe the authors should address the following significant comments and suggestions prior to publication.

1. There is not enough interpretation and analysis of the retrieved altitude profile. The authors need to discuss the large uncertainties and the confidence in the results.

#####> The title and some statements have been changed to mark the results shown as preliminary. See my 2007 follow-up publications for more reliable results.

2. A more thorough comparison of the results of Figures 25 and 27 with the models described earlier in the paper should be made. Perhaps the model results should be included in these figures.

#####> See above.

3. I suggest showing profiles of the observed emission rates. This would provide the reader with a better feel for the quality of the data.

#####> Not I am not sure wether the old data are still present. Due to the rather long processing and reviewing process, most of the source data have been reprocessed

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and cannot be used as comparison. Note that the focus of the publication is rather on the algorithm anyway.

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