

Interactive comment on “Application of tomographic algorithms to Polar Mesospheric Cloud observations by Odin/OSIRIS” by K. Hultgren et al.

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Application of tomographic algorithms to Polar Mesospheric Cloud observations by Odin/OSIRIS Hultgren et al. MS No.: amt-2012-87 MS Type: Research Article

Major points:

This is an interesting paper ostensibly demonstrating the potential of satellite limb tomography for studies of Polar Mesospheric Clouds (PMCs.)

The manuscript does not contain much new about the mathematical aspects of satellite

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limb tomographic recovery other than that already in the literature (see Degenstein, 1999, and key references therein.)

A major concern of this referee is that the authors appear to assume that PMC scattering of sunlight is isotropic in nature and repeatedly associate an isotropic ‘volume emission rate’ to the source limb radiance. The geometry of the OSIRIS ‘in track’ observations, particularly in the Figure 7, orbit 56235 case (observed close to June solstice), must involve a considerable range of scattering angles along the line-of-sight at every tangent height.

The authors should provide more details on this complication and its possible impact or explain why it should not be a concern.

What does Figure 7 tell us about PMCs? What are the ordinate units? Can the abscissa scales be modified to indicate latitude, longitude, solar zenith angle and scattering angle in some way? This would greatly help with meaningful interpretation of the observational data. See also Figs 5 & 6.

The adopted MART solver approach miserably fails to provide any error statistics on the recovery – the authors should acknowledge this very serious limitation of their proposed methodology - perhaps we can move forward and apply derivatives of OE to provide some objective recovery statistics. It would be most worthwhile, and much more worthy of publication in Atmos. Meas. Tech. Discuss., if the authors considered this option.

Minor points:

What is the relevance of Table 1? Only the 15–17 Jun 2011 56233–56261 period seems relevant (see above).

Fig. 1 This provides very little to the potential readership.

Fig. 2 This also provides very little to the potential readership.

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Fig. 4 This also provides very little to the potential readership.

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