

## REVIEW

Title: Improvement of OMI ozone profile retrievals by simultaneously fitting Polar Mesospheric Clouds  
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The authors investigate the effects of PMCs on ozone profile retrieval from BUV spectra measured by a nadir-viewing satellite. Their findings clearly show systematic low biases in the ozone profiles retrieved without including the PMC scattering effects. The authors quantify this PMC-induced low bias in ozone profiles retrieved from OMI observations through comparison with MLS ozone profile measurements. Using MLS ozone as a reference, they further demonstrate that the accuracy of OMI ozone profiles are significantly improved by including a MIE particle model to represent PMC in the forward radiative transfer modeling and retrieving the optical depth of PMC simultaneously with ozone. This is a well-written paper and I recommend its publications in AMT, with minor revision addressing following items:

1. Page 3, line 58, 'residual albedo' is first mentioned here. A description of this quantity is needed.
2. Lines 87, 368, 623, and 639, repeated acronym definition of POD, which is already defined in line 27.
3. Page 7, line 161-163, 'The minimum residual albedo value for PMC detection is derived from measurements of clear atmospheric variability, and is adjusted to eliminate false PMC signal due to instrument noise.' Though this statement implies PMC detection threshold is not a fixed value, a mention of or a reference to the typical value would still be helpful here. Based on the results shown figures 3 and 10, it looks like the threshold value is  $5 \times 10^{-6} \text{ sr}^{-1}$  at 267 nm?
4. Page 7, lines 163-165, 'The false PMC signal due to a negative ozone deviation is screened out using the wavelength-dependence of PMC signals that become stronger at shorter wavelengths.' This statement is not clear. Additional explanation, perhaps pointing to the sensitivity results shown in Fig. 4, would be helpful for a reader.
5. Page 15, lines 384-386, 'It might be explained that positive signal of fitting residuals induced by other factors are misinterpreted to PMC scatterings.' The 'other factors' may need to be specified here. As it is, this statement is too vague to be understood.