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Corrigendum to "Effects of a priori profile shape assumptions on comparisons between satellite NO_2 columns and model simulations" published in Atmos. Chem. Phys., 20, 7231–7241, 2020

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In the abovementioned paper, the authors would like to correct Table 1 and the following equations. These changes represent corrections to the text only and do not affect any of the paper's results.

From Sect. 2.1

$$\Omega_{\mathrm{s}} = M_{\mathrm{G}} \int_0^{\text{tropopause}} \boldsymbol{w}(z)\,\boldsymbol{n}(z)\,\mathrm{d}z \tag{6}$$

$$\mathbf{A}(z) = \frac{M_{\mathrm{G}}\boldsymbol{w}(z)}{M(\boldsymbol{n}_{\mathrm{a}})} \tag{8}$$

From Sect. 2.2.2

$$\Delta_{\mathrm{a}} = \left(\sum_{i=0}^{\text{tropopause}} \frac{M_{\mathrm{G}}\boldsymbol{w}_i\boldsymbol{n}_{\mathrm{m},i}}{M(\boldsymbol{n}_{\mathrm{a}})}\right) - \frac{\Omega_{\mathrm{s,o}}}{M(\boldsymbol{n}_{\mathrm{a}})} \tag{17}$$

$$r_{\mathrm{m}} = \frac{\widehat{\Omega}_{\mathrm{v,o}}}{\Omega_{\mathrm{v,m}}} = \frac{\Omega_{\mathrm{s,o}}/M(\boldsymbol{n}_{\mathrm{m}})}{\sum \boldsymbol{n}_{\mathrm{m}}} = \frac{\Omega_{\mathrm{s,o}}}{\sum \boldsymbol{n}_{\mathrm{m}}}\frac{\sum \boldsymbol{n}_{\mathrm{m}}}{M_{\mathrm{G}}\sum \boldsymbol{w}\boldsymbol{n}_{\mathrm{m}}} = \frac{\Omega_{\mathrm{s,o}}}{M_{\mathrm{G}}\sum \boldsymbol{w}\boldsymbol{n}_{\mathrm{m}}} \tag{20}$$

$$r_{\mathrm{a}} = \frac{\Omega_{\mathrm{v,o}}}{\widehat{\Omega}_{\mathrm{v,m}}} = \frac{\Omega_{\mathrm{s,o}}/M(\boldsymbol{n}_{\mathrm{a}})}{\sum \mathbf{A}\boldsymbol{n}_{\mathrm{m}}} = \frac{\Omega_{\mathrm{s,o}}/M(\boldsymbol{n}_{\mathrm{a}})}{\sum M_{\mathrm{G}}\boldsymbol{w}\boldsymbol{n}_{\mathrm{m}}/M(\boldsymbol{n}_{\mathrm{a}})} = \frac{\Omega_{\mathrm{s,o}}}{M_{\mathrm{G}}\sum \boldsymbol{w}\boldsymbol{n}_{\mathrm{m}}} \tag{21}$$

$$\Delta_{\mathrm{s,a}} = \left(\sum_{i=0}^{\text{tropopause}} M_{\mathrm{G}}\boldsymbol{w}_i\boldsymbol{n}_{\mathrm{m},i}\right) - \Omega_{\mathrm{s,o}} \tag{23}$$

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Table 1. Lexicon comparing notation used in this paper to that used in previous studies.

Variable	Palmer et al. (2001)	Eskes and Boersma (2003)	Boersma et al. (2016)	Notation used here
Air mass factor	AMF	M	M	M
Slant column	Ω_S	S	N_S	Ω_s
Vertical column	Ω_V	V	N_V	Ω_v
Scattering weight	$\boldsymbol{w}(z)$			$\boldsymbol{w}(z)$
Box air mass factor		C_l	m_l	$M_G \cdot \boldsymbol{w}(z)$
Shape factor	$\boldsymbol{S_z}(z)$			$S(z)$
Averaging kernel		$\mathbf{A}$	$\mathbf{A}$	$\mathbf{A}$
Number density	$\boldsymbol{n}(z)$	X	x_l	$\boldsymbol{n}(z)$
Geometric AMF	AMF_G			M_G

* Note that many studies such as Krotkov et al. (2017) may refer to this term as the scattering weight using the notation W.

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References

Boersma, K. F., Vinken, G. C. M., and Eskes, H. J.: Representativeness errors in comparing chemistry transport and chemistry climate models with satellite UV–Vis tropospheric column retrievals, Geosci. Model Dev., 9, 875–898, https://doi.org/10.5194/gmd-9-875-2016, 2016.

Eskes, H. J. and Boersma, K. F.: Averaging kernels for DOAS total-column satellite retrievals, Atmos. Chem. Phys., 3, 1285–1291, https://doi.org/10.5194/acp-3-1285-2003, 2003.

Krotkov, N. A., Lamsal, L. N., Celarier, E. A., Swartz, W. H., Marchenko, S. V., Bucsela, E. J., Chan, K. L., Wenig, M., and Zara, M.: The version 3 OMI NO_2 standard product, Atmos. Meas. Tech., 10, 3133–3149, https://doi.org/10.5194/amt-10-3133-2017, 2017.

Palmer, P. I., Jacob, D. J., Chance, K., and Martin, R. V: Air massfactor formulation for spectroscopic measurements from satelites' Application to formaldehyde retrievals from the GlobalOzone Monitoring Experiment, J. Geophys. Res., 106, 14539–14550, https://doi.org/10.1029/2000JD900772, 2001.