



## Corrigendum to

# “Coarse and giant particles are ubiquitous in Saharan dust export regions and are radiatively significant over the Sahara” published in Atmos. Chem. Phys., 19, 15353–15376, 2019

Claire L. Ryder<sup>1</sup>, Eleanor J. Highwood<sup>1</sup>, Adrian Walser<sup>2</sup>, Petra Seibert<sup>3</sup>, Anne Philipp<sup>2</sup>, and Bernadett Weinzierl<sup>2</sup>

<sup>1</sup>Department of Meteorology, University of Reading, Whiteknights, Reading, RG6 6BB, UK

<sup>2</sup>University of Vienna, Faculty of Physics, Aerosol Physics and Environmental Physics, Vienna, Austria

<sup>3</sup>University of Natural Resources and Life Sciences, Institute of Meteorology, Vienna, Austria

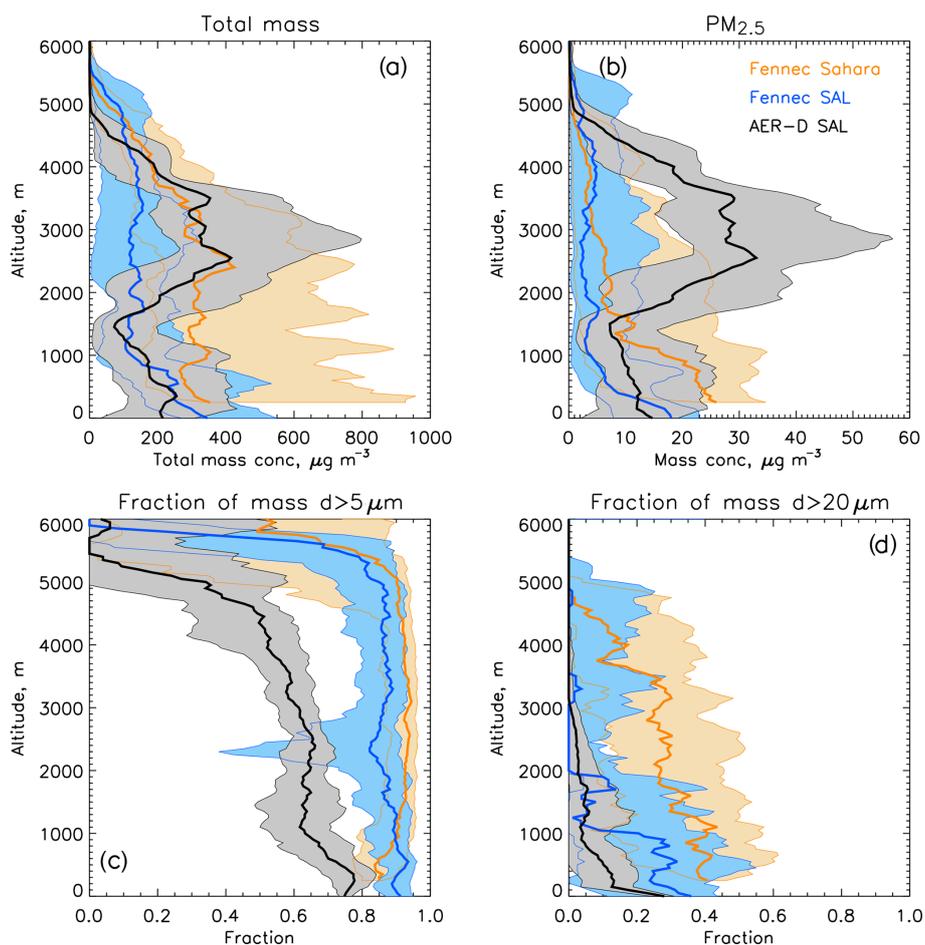
**Correspondence:** Claire L. Ryder (c.l.ryder@reading.ac.uk)

Published: 14 April 2020

The authors became aware that the original Fig. 5 and associated values in the text used size distribution data corrected with a refractive index of  $1.53-0.002i$  for the Fennec-Sahara and Fennec-SAL field campaigns, despite stating that refractive indices of  $1.53-0.001i$  were used. No other subsequent data or figures are affected. This corrigendum corrects the mass concentrations and associated percentage underestimations so that all data are processed with a refractive index of  $1.53-0.001i$ .

The changes are as follows.

- Abstract: “Excluding giant particles over the Sahara results in significant underestimation of mass concentration (27 %).”
- Section 3.1, paragraph 7: “Fennec-Sahara mass concentrations can be extremely high, especially at lower altitudes, with the 75th percentile reaching values of up to  $960 \mu\text{g m}^{-3}$ .”
- Section 3.1, paragraph 8: “It is clear in panel (c) that during Fennec-Sahara the vast majority of dust mass was present at sizes greater than  $5 \mu\text{m}$  (an average of 92 % beneath 4.5 km), similar to Fennec-SAL (87 % between 1 and 5 km), and also a large amount during AER-D-SAL (61 % between 1 and 4 km in the SAL). Since models begin to underestimate dust concentration at sizes above  $5 \mu\text{m}$  diameter, showing an underestimation by up to a factor of 10 (Kok et al., 2017), a very large fraction of mass will be neglected. Similarly, during Fennec-Sahara, sizes greater than  $20 \mu\text{m}$  in diameter were still found to contain 27 % of the dust mass beneath 4.5 km (panel d), or up to 61 % for the 75th percentile. For both AER-D-SAL and Fennec-SAL, 2 % of the total mass was found at these large diameters, though the 75th percentile reaches up to 19 % and 43 %, respectively.”
- Section 3.1, paragraph 9: “Mean DMPs are calculated at  $2.2 \text{ g m}^{-2}$  (0.6 to  $9.5 \text{ g m}^{-2}$ ) for Fennec-Sahara,  $1.5 \text{ g m}^{-2}$  (0.2 to  $6.2 \text{ g m}^{-2}$ ) for AER-D-SAL, and  $1.0 \text{ g m}^{-2}$  (0.1 to  $1.6 \text{ g m}^{-2}$ ) for Fennec-SAL.”
- Conclusion, paragraph 4: “Over the Sahara, 91 % of dust mass is constituted by particles sized larger than  $5 \mu\text{m}$  on average, and 27 % of dust mass is constituted by particles sized larger than  $20 \mu\text{m}$ .” “Over the SAL, the fraction of mass omitted is smaller compared to the Sahara but potentially still important: 61 % to 87 % of dust mass is constituted by sizes over  $5 \mu\text{m}$  and 2 % from sizes over  $20 \mu\text{m}$ .”



**Figure 5.** Vertically resolved mass concentrations for Fennect-Sahara (orange), Fennect-SAL (blue), and AER-D-SAL (black). **(a)** Total mass concentration across all sizes measured; **(b)** accumulation-mode mass concentration  $d < 2.5 \mu\text{m}$ ; **(c)** fraction of mass at  $d > 5 \mu\text{m}$  and **(d)**  $d > 20 \mu\text{m}$ . Bold lines and shading indicate the median and interquartile range, respectively. Data are smoothed over 250 m intervals and for Fennect-Sahara only available down to 350 m due to flight restrictions.