Dear editors,

In the last proof-reading, we want to correct the unit of LWC in Equation 1 and 2. The detailed explanation is as follows.

With regards,

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The original Equation 1 and 2 are:

$$(1)\ \mathrm{VIS}[\mathrm{m}] = 27\mathrm{LWC}\left[\mathrm{g\ cm^{-3}}\right]^{-0.88}$$

$$(2)\ \mathrm{VIS}[\mathrm{m}] = 1002\left(\mathrm{LWC}\left[\mathrm{g\ cm^{-3}}\right] \cdot N_d\left[\mathrm{cm^{-3}}\right]\right)^{-0.6473}$$

We want to change the unit of LWC from g cm^{-3} to g m^{-3}.

Equation 1 is from Kunkel (1983), and Equation 2 is from Gultepe et al. (2006). In these two papers, the units of LWC is g m^{-3} (e.g., Figure 1 and 2). We have carefully checked our code that calculates the visibility. The unit of LWC is correctly treated as g m^{-3}. Therefore, it is only a typo in the paper.

Eldridge (1966) derived the following empirical relationship between β and W for "stable and evolving" fogs based on fog drop-size distributions inferred from measured spectral transmission through fog with the aid of Mie scattering theory. The droplet range measured was 0.6–16 μm diameter,

$$\beta = 163W^{0.65}, \qquad (6)$$

where W is in g m^{-3} and β is in km^{-1}.

Figure 1. The screenshot from Kunkel (1983). Here the "W" means LWC.
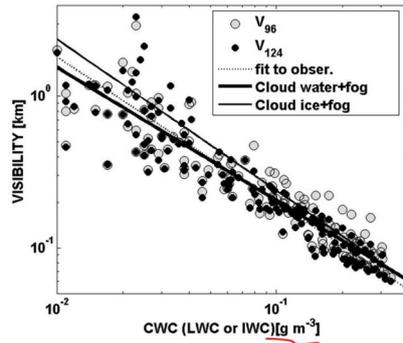
FIG. 3. The visibility calculated from FSSP measurements and from K84 Vis–LWC (as cloud water + fog) and Vis–IWC (as cloud ice + fog) relationships. The V_{96} and V_{124} are for FSSP-96 (over original size ranges) and FSSP-124 (over extended size ranges) observations, respectively.

Figure 2. The screenshot from Gultepe et al. (2006).

References

Kunkel, B. A.: Parameterization of Droplet Terminal Velocity and Extinction Coefficient in Fog Models, J. Appl. Meteorol., 23, 34–41, https://doi.org/10.1175/1520-0450(1984)023<0034:PODTVA>2.0.CO;2, 1983

Gultepe, I., Müller, M. D., and Boybeyi, Z.: A New Visibility Parameterization for Warm-Fog Applications in Numerical Weather Prediction Models, J. Appl. Meteorol. Clim., 45, 1469–1480, https://doi.org/10.1175/jam2423.1, 2006