Atmospheric
Measurement
Techniques

Supplement of

Quantification of the effect of modeled lightning NO$_2$ on UV–visible air mass factors

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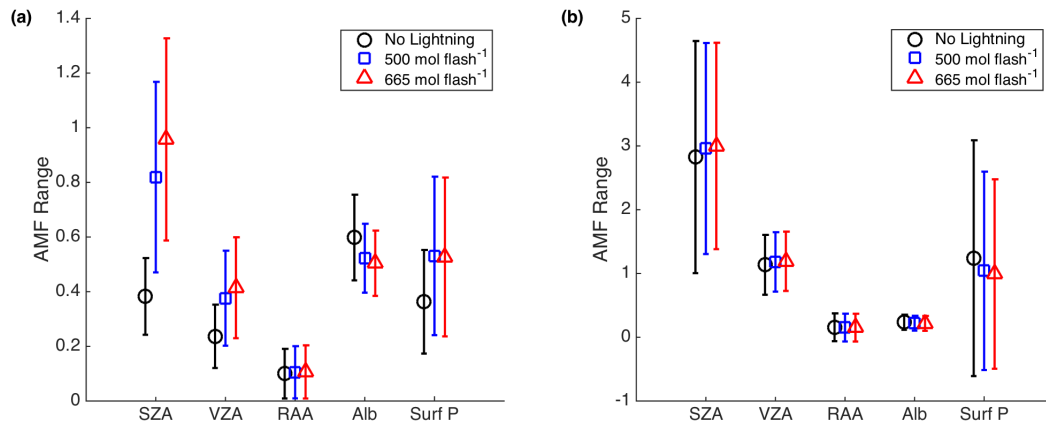*Correspondence to:* Ronald C. Cohen (rccohen@berkeley.edu)

Figure S1: The sensitivity of the AMF to different input parameters to the TOMRAD lookup table for conditions relevant to clear sky pixels (a) and cloudy pixels (b) using the WRF-Chem profile averaged over the entire domain. The marker (circle, square, or triangle) represents the average range of the AMF (max − min) due to varying a given parameter while holding the other four constant; the error bars represent the 1σ variability in that range for all combinations of the other four parameters.
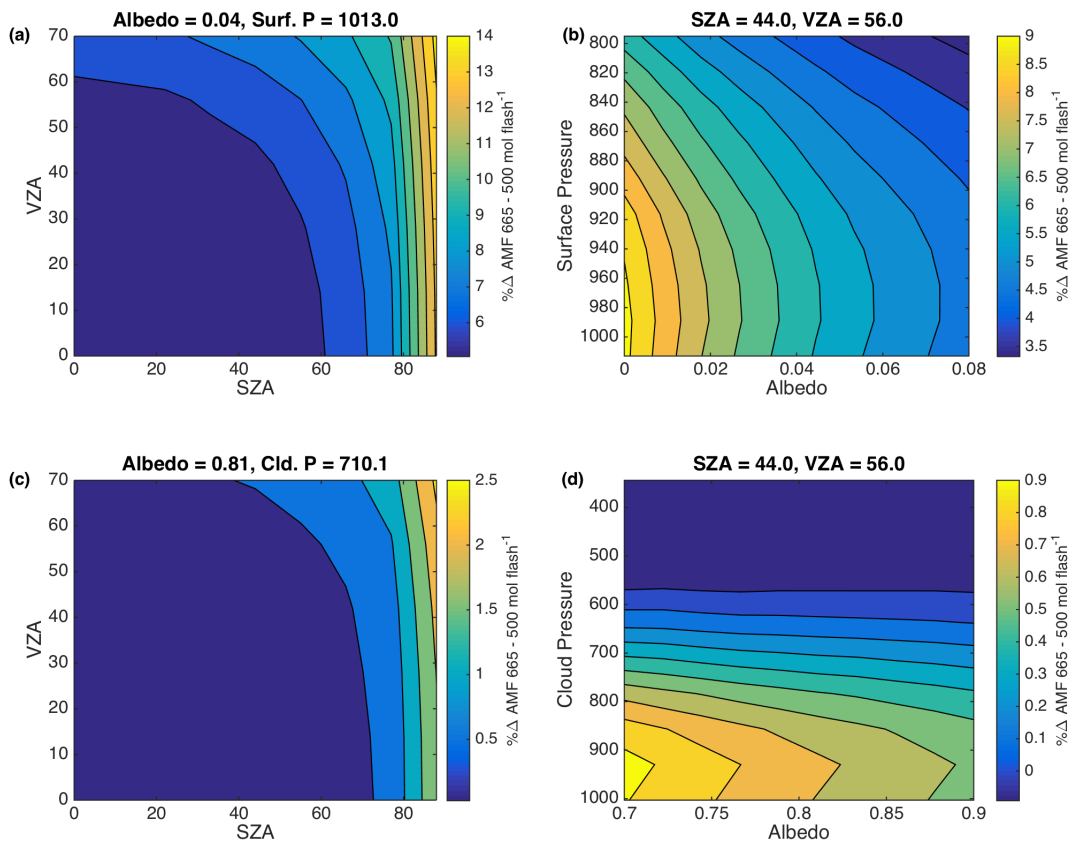
Figure S2: As in Fig. 3 and 4, but now the percent difference in AMF between using profiles generated with 665 and 500 mol NO flash^{-1}.
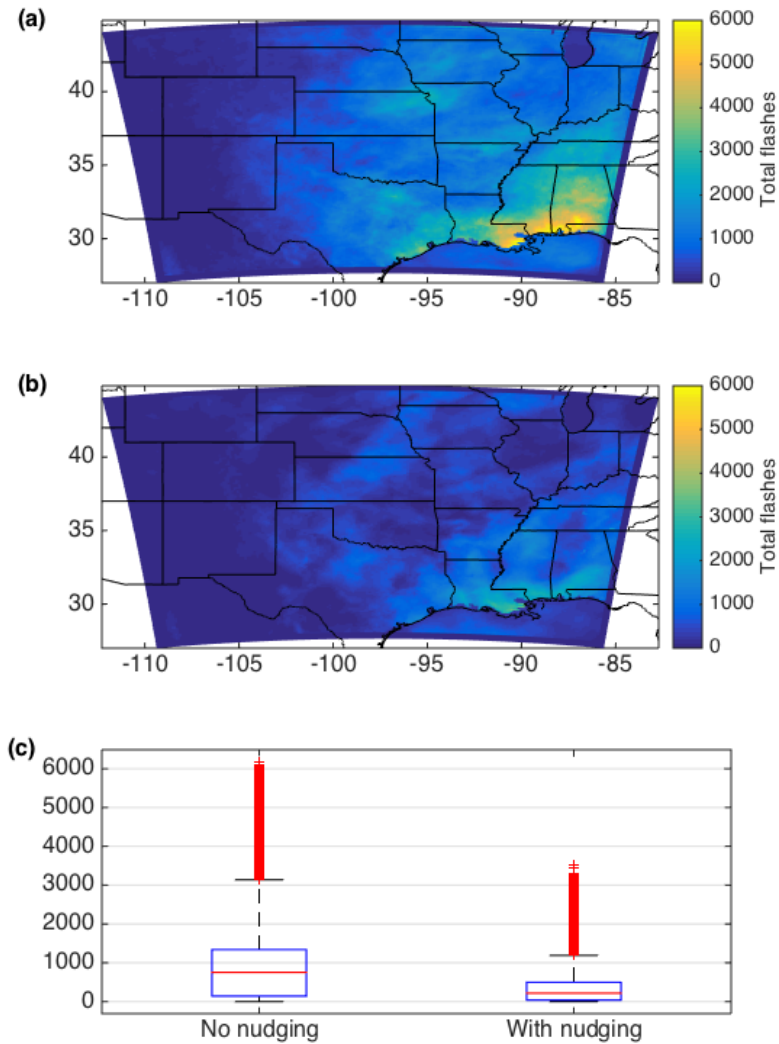
Figure S3: The effect of FDDA nudging on number of lightning flashes. (a) Total number of modeled lightning flashes during the entire modeled time period (13 May to 24 June 2012) without nudging. (b) Same as (a), but for the model run with nudging. (c) Box plot of the statistics for total number of modeled flashes across the domain. The central mark is the median, the box edges the upper and lower quartiles, the ends of the whiskers are the greatest and least non-outlier value, and the individual marks are outliers.
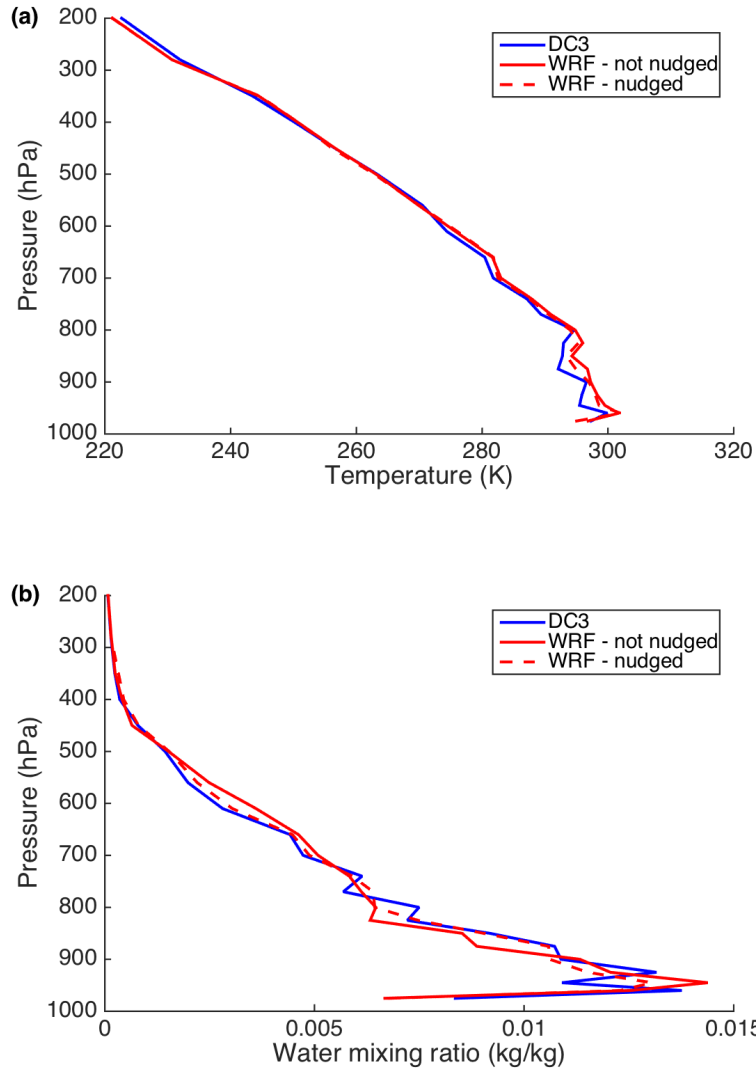
Figure S4: (a) Temperature and (b) water vapor profiles averaged over the DC3 campaign (blue) or WRF data matched to the DC3 flight path as described in Sect. 2.3 (red). WRF data resulting from the unnudged run is the solid line, data from the nudged run is the dashed line. Note that both the nudged and unnudged runs' temperature profiles agree with the DC3 profile similarly well, while the nudged water vapor profile exhibits better agreement with the DC3 profile than the unnudged one.