

Supplement:

Mean normalized bias (MNB), mean normalized error (MNE), normalized mean bias (NMB), and normalized mean error (NME) are defined as the followings:

$$MNB = \frac{1}{N} \sum_{i=1}^N \frac{(C_i^s - C_i^o)}{C_i^o} \times 100\%$$

$$MNE = \frac{1}{N} \sum_{i=1}^N \frac{|C_i^s - C_i^o|}{C_i^o} \times 100\%$$

$$NMB = \frac{\sum_{i=1}^N (C_i^s - C_i^o)}{\sum_{i=1}^N C_i^o} \times 100\%$$

$$NME = \frac{\sum_{i=1}^N |C_i^s - C_i^o|}{\sum_{i=1}^N C_i^o} \times 100\%$$

where C_i^s and C_i^o represent simulated and observed concentrations at the same monitoring site for the same hour, respectively, and N is the total number of such data pairs of interest.