

Interactive comment on “Constraining the concentration of the hydroxyl radical in a stratocumulus-topped marine boundary layer from sea-to-air eddy covariance flux measurements of dimethylsulfide” by M. Yang et al.

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Note that this Editor review represents the 2nd (final) review of this manuscript

In their replies to the reviewer and I. Faloon, the authors have defended the integration of their approach across wide spatial and temporal scale by showing maps that demonstrate the lack of DMS horizontal gradients, used radiosonde data to demonstrate the stability of the boundary layer structure, extended their analysis of the OH

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diurnal cycle by considering a square root relationship to JO1D, and extended the error analysis (including an assumed error in entrainment velocity) to the final result.

In their final revised manuscript, I would also like them to consider the following: 1. A short discussion regarding the fact that the uncertainty in the entrainment velocity is probably biased in one direction. 2. As pointed out by I. Faloon, the OH diurnal cycle more likely resembles a square root relationship to JO1D – this should be the default fit. Previous marine boundary layer OH measurements should be discussed (e.g. those at Cape Grim and Mace Head). The paper would also be strengthened by inclusion of representative NO_x and CO data with a simple photochemical analysis of the expected [OH]. 3. Some discussion of the potential impact of the presence of BrO on the results is required. The reaction of BrO with DMS is approx 10 times slower than that with OH, so only 1-2 pptv of BrO would be required to compete equally with OH (an average daily maximum of ~2.5 pptv BrO was observed at the tropical station of Cape Verde – Read et al., 2008). The presence of BrO could potentially explain why the simulated OH diurnal cycle shows a direct rather than square root relationship to JO1D.

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