

## ***Interactive comment on “Closing the Dimethyl Sulfide Budget in the Tropical Marine Boundary Layer during the Pacific Atmospheric Sulfur Experiment” by S. A. Conley et al.***

**Anonymous Referee #2**

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This paper reports aircraft data on DMS fluxes and interprets them in terms of the overall DMS budget. The paper addresses an interesting issue and is worthy of publication after the following (mainly notation) issues are addressed:

1. The paper begins with a discussion of the CLAW hypothesis but there is no closure on this subject in the following material. Does this work prove or disprove CLAW? If not, then why discuss CLAW here? 2. In equation (1) the dot should follow the gradient operator and  $u$  should be bold font to denote a vector. 3. What is meant by lines 23-24 on p.17267? Do you mean: “where  $c$  is the DMS mole fraction which is the sum of the fluctuating component  $c'$  and its ensemble mean  $\langle c \rangle$ ,  $u$  is the instantaneous wind

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velocity, etc.” 4. Justify neglect of turbulent fluctuations in  $L$  on line 25, p. 17267. 5. Why do you change from lower case  $c$  in equation (1) to uppercase  $C$  in equation (2)? 6. On p. 17268, line 2, the first 2  $u$ 's should be bold (vectors). 7. Spell out a.m.s.l. on p. 17268, line 23. 8. On page 17270, on lines 10 and 24, and in equations (3) and (4), “ $C$ ” should be lowercase “ $c$ ” to maintain consistent notation. Also “ $mi$ ” not “ $Mi$ ” in equation (4) and line 24 for consistency with  $c$ . 9. On p. 17271, line 20 and in equations (5) through (8), the  $u$ 's in the divergence operator should be bold (vectors). 10. You say on p. 17269 that the “circle” flights were abandoned due to contamination yet you appear to report “circle” data on p.17273, lines 5-6, and Table 1. Please clarify. 11. In section 4.1 there is a strange symbol (circle with a dash in the middle). Where is it defined? Is it supposed to be “theta” as in Figure 10 (I presume theta is potential temperature, so add definition to caption and section 4.1). 12. Do you think the restriction of “night” flights to later than 3am (p.17278, lines 24-27) could bias the 80% number on p.17276, line 18, specifically causing it to be too high (e.g. due to omission of times of less vigorous convection and turbulence at night)? 13. The text in section 4.3, lines 13-16 needs clarifying. What are the dimensions of matrix  $X$ ? Should “ $M$ ” on line 15 be  $M_{ii}$ ? 14. On p. 17280, say “10m wind speed” instead of “ $U_{10}$ ” for clarity. 15. Please check that all references are actually cited in the text (e.g. Davis et al?). 16. In Table 1, use lower case  $c$ 's,  $u$ 's and  $v$ 's for consistency. 17. Increase the font size in the axis labels of Figures 2, 3 and 7.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 17265, 2009.

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