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Ocean Science
Discussions

Interactive comment on "Numerical tools to estimate the flux of a gas across the air-water interface and assess the heterogeny of its forcing functions" *by* V. M. N. de C. da S. Vieira

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Dear Topic Editor, Dear Revewer 1,

As I said I would in the previous answer, I have included the algorithms by Stull (1988) and Lee (1997) for the estimates of atmospheric stability and its effects. Therefore, I have model version 1.2 for supplementary material. I would like to introduce this in the article, as reviewer 1 suggested. However, this requires adding one more figure and some significant changes in the related sections of the text. Before I proceed I ask the reviewer and topic editor whether you agree with it. Below, I send the figure and a few lines of related text to help your judgement.

Furthermore, I acknowledge the reviewer's tip about Stull (1988): it was quite handy! It was also quite thrilling developing the model to include these formulations!

"The Lee (1997) formulations do not hold beyond the known 0.2 critical Richardson number. Below this threshold they were much more sensitive than the Stull (1988) formulation. When atmospheric conditions get much unstable the Lee (1997) formulations start exhibiting very high predictions with a slight exponentially increase, which is not credible.

For the bulk Richardson number estimates were considered two heights. At height z the air temperature was Ta and pressure was P. At height 0 the air temperature was considered equal to Tw and pressure was P. Following Geernaert and Larsen (1993) relative humidity was considered 0.7 at z and 1 at z=0. The wind difference between these two heights was $\Delta u = u10$.

Were not included the 'Cool skin' and 'Warm layer' effects. When included, besides atmospheric stability, these should also affect solubility. "

Kind regards, Vasco Vieira

Interactive comment on Ocean Sci. Discuss., 9, 909, 2012.

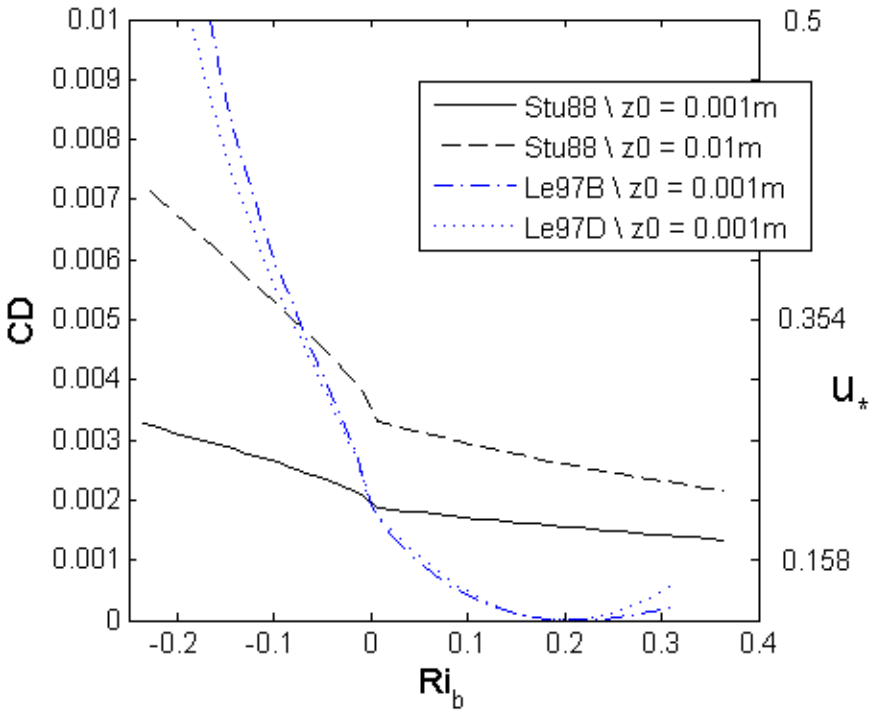

Fig. 1. Figure – Atmospheric stability effect following the algorithms by 'Stu88': Stull (1988), 'Le97B': Lee (1997) fit to Businger et al (1971) and 'Le97D': Lee (1997) fit to Dyer (1974). P at 1atm, u10 at