**Biogeosciences
Discussions**

Interactive
Comment

Interactive comment on "Surface layer similarity in the nocturnal boundary layer: the application of Hilbert-Huang transform" *by* J. Hong et al.

J. Hong et al.

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Thank you very much and we appreciate your kind comments on our manuscript. We, authors believe that sharing your wisdom and constructive comments improve this manuscript a lot. As you have suggested, we have revised the manuscript by incorporating all of the comments provided by the referee 1. Below is the authors' response to the reviewers.

Page 9682, L17 (Eq. (4)): Huang et al.(1998) pointed out that a typical value for SD can be set between 0.2 and 0.3. Why did you adopt the value of 0.1 here?

> Reply: 0.1 is much more strict condition compared to the values suggested in Huang et al. (1998) for the sifting process. To use 0.1 is, therefore, computationally expensive

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but it is worth doing because the sifting process is a core of the application of the HHT to turbulence data in our study.

Page 9696, Fig. 4: Why did you remove "seven" IMFs? How did you determine this number? > Reply: This is very important question. Unlike wavelet or Fourier transform, many portion of the HHT is still empirical and needs more theoretical study like Dr. Daubechies did for the wavelet transform. So our approach was to remove the longest IMF one by one until scatters in the plots were minimized. We just speculate that the removed components are related to gravity wave because of the stably stratification but it could not be exactly assured since we did not have sensors to say the evidence of gravity wave such as a microbarograph in our field experiment. Absolutely, further study should be done to solve this issue.

Fig.3 and Fig.4: Theoretical functions of $\sigma_{u,w}/u_*$, σ_T/T_*, σ_c/c_* should be shown these figures, and the authors should compare these functions with observed values, and discuss the adequacy of the application of HHT from this comparison. > Reply: We believe that this was discussed in the text (around 185 line) and the results from previous studies were added to these figures.

Fig.7 is NOT referred to (or used) in this manuscript. > Reply: The text was added to include the discussion for this figure. Thank you.

Page 9687, L3: The word "decreased" would be "increased", from -0.35 to zero. > Reply: The text was revised. Thank you.

Page 9687, L6-7: Replace period after "Unlike r_{uw}" by comma ",". > Reply: The text was revised. Thank you

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