Biogeosciences Discussions

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

Anonymous Referee #1

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1   General comments:

In this paper, the authors applied the relatively new method, Hilbert-Huang transform (HHT), to 10Hz field data to investigate the surface layer similarity in the nocturnal stable boundary layer. By applying HHT, the authors showed the non-turbulent component and its effect on the normalized turbulence statistics can be separated effectively, and the results using turbulent components supports the findings of previous studies on the stable boundary layer characteristics. This paper seems, as far as I can see, to be the first attempt to apply HHT method in micrometeorological studies, although HHT have been applied widely in natural sciences and originally Huang et al.(1999) showed the example of application of HHT to the wind data. It is well written manuscript, includ-

ing novel apporach, and address the relevant questions within the scope of Biogeosciences. I recommend this manuscript for publication after some revisions.

2   Specific comments:

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?

Page 9685, L10: How did you "use" the 300-s recursive moving average? It may work as the smoothing (or low-pass) filter. Did you "adopt" the smoothed data in calculating normalized standard deviation in Fig.3? Or did you "subtract" the filtered data from the original data? The word "using" does not discribe what you did. Similar expression can be found in the caption of Fig. 3.

Page 9696, Fig. 4: Why did you remove "seven" IMFs? How did you determine this number?

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.

Fig.7 is NOT referred to (or used) in this manuscript.

3   Technical corrections:

Page 9687, L3: The word "decreased" would be "increased", from -0.35 to zero.

Page 9687, L6-7: Replace period after "Unlike r_{uw}" by comma ",".

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