

## ***Interactive comment on “Intermittent particle dynamics in marine coastal waters” by P. R. Renosh et al.***

**P. R. Renosh et al.**

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Received and published: 15 September 2015

**Referee:** The authors provide recalls on theoretical notions related to intermittency and interpretation of  $\zeta(q)$  curves. But these important explanations appear somewhat lately in the manuscript, namely in Sect. 3.3 and in Appendix C. Perhaps this might be a bit confusing for nonfamiliar readers?

Answer: As per referee’s suggestion we will incorporate this explanation as a sentence in the introduction (Page number 1036 line number 2). “AHSA scaling exponent function  $\xi(q)$  is related with the classical structure function scaling exponent  $\zeta(q)$  by  $\xi(q) = \zeta(q) + 1$ , where  $q$  is the statistical moment.”

**Referee:** On Figs 4 7, the curves of  $\zeta(q)$  are not coherent with the theoretical

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value  $\zeta(0) = 0$ . How do the authors explain this behavior? If this is the consequence of an external artifact or some special property of the time series, can we guarantee that other scaling exponents are not shifted or translated downwards on the figures? Otherwise, there could be an underestimation of the (algebraic) value of the Hurst parameter?

Answer: In fact it is possible to have  $\zeta(0) \neq 0$  for time series having a large number of  $\Delta X$  value equal to 0.  $\zeta(0) = 0$  only if there are no zeros in the time series. When  $H < 0$  such situation is more likely than when  $H > 0$ , because the series is more noisy. We will add some comments on this point in the revised manuscript.

**Referee:** Results in paragraph 3.3 suggest some dependence of  $H$  on the size of particles. It seems that the authors could highlight their conclusions by providing error bars on  $H$  estimates.

Answer: The error bar of  $H$  will be incorporated in the text as well as in the Figure 7. The other error bars will also be incorporated in the text as well as in figures (Figure 4A and Figure 8E).

**Referee:** The memory scale of 36 min could be reported on the spectra to highlight the apparent coherence with spectral break positions.

Answer: The memory scale of 36.26 min will be incorporated in the figure 4(a) as a vertical line.

**Referee:** At the beginning of Sect. 3.3 and in Fig. 6, the authors should clarify which physical variable is analyzed. It seems that the authors present the scaling analysis of time series of volumetric concentrations conditioned by four different particle classes. But the formulation is a bit confusing: what means “The power spectra of these 4 size classes...” (p. 1041)?

Answer: LISST measures the time series of a spectrum of volume concentration ranges from  $2.5 \mu m$  to  $500 \mu m$ . Here we decomposed the volume concentrations

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into 4 size classes say silt, fine, coarse and macro particles depending upon the size range of each size class. The time series of each size class has been derived from this and power spectra also derived.

**Referee: Did the authors try to use first-order Haar structure function analysis to confirm their estimates of  $H$ ?**

Answer: To answer this request, we have tested our time series with HAAR structure function method. We have selected the same scaling region of AHSA for this analysis. We found negative Hurst exponent for all parameters similar to AHSA method (in some cases there are some slight differences). The information of the comparison between  $H$  computations between these two methods will be inserted as a table in the revised version.

**Referee: Paragraph 3.4 : the  $\beta$  estimates could be added in the text.**

Answer: The information of the  $\beta$  will be incorporated in the text. For that The sentence starting with "A good scaling between" of page number 1042 line number 9 will be rewritten as " A good scaling between 0.002-0.09 Hz with  $\beta$  value of -0.8 for cp(670) and of -0.9 for Cvol-total has been observed".

**Referee: On Figs. 2-3, or in the text, please add some additional information about the "3000 samples" (e.g., beginning/end dates...).**

Answer: These 3000 samples are from the beginning of the time series. This information will be added in legends of figures 2 and 3.

**Referee:**

- P. 1035 : "same in situ data set than" → "same ... as"
- P. 1037 : "There statistical and dynamical properties are considered..." → "Their statistical ..."
- P. 1039: "The low frequency variability of (...) are controlled" → "The low frequency variability (...) is controlled"

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- P.1040: "One of the very interesting feature... of LISST" → " A very interesting feature of LISST"

- P. 1043: "We may note that the Hurst exponent (...) are negative" → "(...) exponents (...) are negative"

Answer: These changes will be incorporated in the revised version of the manuscript.

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Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 1033, 2015.