Review of the manuscript npg-2015-40, entitled: « Intermittent particle dynamics in marine coastal waters », by P.R. Renosh, F.G. Schmitt, and H.Loisel.

Summary & Evaluation :

This interesting paper presents the scaling analysis of in-situ particle observations (time series) collected in a marine coastal environment. The observations are related to concentrations and number densities of particles of various sizes. They provide information about suspended particulate matter at fine temporal resolution.

Noticeable spectral and intermittent/multifractal scaling properties are evidenced from the data:

- For all time series considered, two main scaling regimes are identified, separated by a transition at roughly 30 min time scales.
- The low-frequency regime (related to turbulence) has steeper spectra than the higher-frequency one. The latter regime (roughly ~ 30 min – 10 s) is very likely impacted by processes related to the sea bottom.
- In the latter regime, nonclassical negative Hurst exponents H are obtained, which is significantly different from classical turbulent properties (with H = 1/3). Nevertheless, the regime is also characterized by intermittent (multifractal) properties.
- Even though remaining still negative, H becomes closer to 0 in the special case of suspended particle matter proxies.

Besides, an important originality of the paper is the use of arbitrary-order Hilbert spectral analysis (AHSA) which is an emerging way of performing multifractal analysis of nonstationary time series.

Overall, this is a good paper that perfectly fits NPG scope. I think that the manuscript deserves publication after minor changes.

Specific (minor) comments :

1) 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?
2) On Figs 4 & 7, the curves of zeta(q) are not coherent with the theoretical 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?
3) 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.
4) The memory scale of 36 min could be reported on the spectra to highlight the apparent coherence with spectral break positions.
5) 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)?

6) Did the authors try to use first-order Haar structure function analysis to confirm their estimates of H ?
7) Paragraph 3.4 : the beta estimates could be added in the text.
8) On Figs. 2-3, or in the text, please add some additional information about the « 3000 samples » (e.g., beginning/end dates…).
9) Several details :
   - 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”
   - 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”