

Interactive comment on “Time-clustering of wave storms in the Mediterranean Sea” by G. Besio et al.

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Dear Riccardo and coauthors,

I'm writing only to mention an aspect that can potentially make your results misleading. From Figures 2 and 3, and discussion in the text, I see that the waves show a clear seasonal pattern (as expected); however, from the text, it seems that you did not pre-process the data to remove it. If it is so, please consider that what you see in the AF diagrams can easily be an artefact related to seasonality. In fact, the spike at about 180 days is typical of seasonal time series (seasonality affects all scales below one year). For a comparison and further details on the impact of seasonality on AF diagrams, please have a look at Fig. 4 in

Serinaldi F, Kilsby CG. On the sampling distribution of Allan factor estimator for a ho-

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homogeneous Poisson process and its use to test inhomogeneities at multiple scales. *Physica A: Statistical Mechanics and its Applications* 2013, 392(5), 1080-1089.

Thus, if you did not remove the seasonal pattern, you can easily confuse (apparent) scaling with (true) seasonal fluctuations, which in turn can be explained by non-homogeneous Poisson processes rather than fractal point processes with crossover. As shown in the paper above, in these cases, the AF patterns should be compared with those corresponding to non-homogeneous (seasonal) Poisson processes (to be used as non-trivial benchmark processes); alternatively, you can try to remove the seasonality by data stratification (i.e., making analyses on a seasonal basis).

You can also be interested to

Serinaldi F. On the relationship between the index of dispersion and Allan factor and their power for testing the Poisson assumption. *Stochastic Environmental Research and Risk Assessment* 2013, 27(7), 1773-1782.

If you need some feedback, please feel free to write to me.

Sincerely,

Francesco

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, doi:10.5194/nhess-2016-318, 2016.

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