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Interactive comment on "Temporal energy partitions of Florida extreme sea level events as a function of Atlantic multidecadal oscillation" *by* J. Park et al.

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Overall this is an interesting paper. Wavelet transform is used to examine the relative energy distribution of extreme sea level events across scale/frequency. However, the general increasing trend of the energy from tidal (periods of 6-24 h) to synoptic (periods of several days) time scales as shown in Fig.1 as well as Tables 3 & 4 reminds me of an easily neglected wavelet bias. This across scale increasing trend is very similar to the typical example of the biased wavelet power spectrum of coastal sea level at St. Petersburg, Florida (see Liu et al. 2007, Fig. 1 the original wavelet power spectrum), in which the energy in low frequency band was amplified with respect to that in high

frequency band. As pointed out in Liu et al. (2007), some estimation of wavelet energy may be biased if the energy is not properly defined. A physically consistent definition of wavelet power spectrum should be divided by wavelet scale. Rectification of the wavelet bias is also suggested in Liu et al. (2007), and easy to implement.

To see whether the wavelet energy is biased or not, one can use an artificial time series with known energy distribution across scale, e.g., a time series comprised of sine waves with the same amplitude at different frequencies (Liu et al. 2007, Fig. 2). If the bias exists in the wavelet energy, it should be corrected, because this is the crux of this paper – to quantify the wavelet energy across scale/frequency.

Reference:

Liu, Y., X.S. Liang, and R.H. Weisberg, 2007: Rectification of the bias in the wavelet power spectrum. Journal of Atmospheric and Oceanic Technology, 24(12), 2093-2102.

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