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Interactive comment on "Critical behavior in earthquake energy dissipation" *by* J. Wanliss et al.

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We thank the reviewer for thoughtful and helpful comments. In our reply I will quote the reviewer comments and then respond.

1) In Figure 1, to be consistent with the text the time coordinate should be from October 2000 to January 2007.

This will be corrected in the revision.

2) On Page 625, Lines 26-27, the authors state that the time series of radiated energy is strongly intermittent and multifractal. This statement should be clarified with a characterization of intermittency and multifractality of this time series, e.g., plot the probability distribution function and the scaling exponent of energy fluctuations.

The multifractality of these data are demonstrated in detail in the paper by Pasten and

Comte, 2014, and we have listed this paper. We will make the reference more explicit: " ... show evidence of strong intermittency, and have a multifractal nature, [as shown by Pastén and Comte (2014)].

3) The authors conclude that the earthquake dissipation mechanisms are scale-free and self-similar. But, according to Figure 1 the energy fluctuations are multifractal, which implies that the earthquake dissipation mechanisms are not monofractal and deviates from self-similarity due to the existence of intermittent structures (singularities). This point must be clarified.

This comment helps us avoid potential confusions. In our revisions we will add clarification that though there is self-similarity it is not monofractal scaling that we observe.

4) The authors claim that the power-law exponents describing the probability distributions indicate that the main energy dissipation is caused by large bursts of earthquake activity, as opposed to smaller bursts of seismic activity with higher occurrence rate. Is this claim universal in all SOC systems such as space weather and city traffic, or it is only a feature of this geophysical data set?

This is an interesting comment. We are not sure about city traffic, but our intuition from our experience is that in space weather the situation is not as intermittent, and that the energy dissipation is more relevant for smallest events, however the large ones (storms and substorms) show intermittency and are multifractal.

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 619, 2015.