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

Anonymous Referee #2

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This is an interesting paper on nonlinear time series analysis of geophysical data. The aim is to show that a set of earthquake data for seismic events, with magnitude exceeding 1.6 detected in Chile from October 2000 to January 2007, present evidence of statistical and dynamical self-similarity. In previous papers, the authors have demonstrated similar behaviours in the time series of space weather and city traffic. Before its publication, some revisions are necessary: 1) In Figure 1, to be consistent with the text the time coordinate should be from October 2000 to January 2007. 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. 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. 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?

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