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Interactive comment on "Earthquake source parameters which display first digit phenomenon" *by* P. A. Toledo et al.

Anonymous Referee #1

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This manuscript displays some first digit distributions of various measurable quantities from earthquake source processes and identifies that they tend to follow Benford's law (BL). It goes on to point out that similar behaviour is seen in a self organized criticality model for the earthquake source. It is implied that this lends weight to the notion that earthquake nucleation follows such a model. While I accept that the observations and link to BL look sound, I do not believe that this allows any casual relationship to be inferred, i.e. that the BL nature of first digits of SOC model leads to the appearance of BL in source observations. This is because, as pointed out by Fewster (2009), BL itself is a common feature of multi-decadal real valued datasets and the fact that it occurs across any two measurable quantities does not imply that the two are casually related. Indeed Fewster argues that under many circumstances it can be difficult for multi-decadal datasets to not obey BL. As I see it this argues against one of the central

observations of the manuscript.

Irrespective of the comments above, Fewster (2009) should be cited as a good reference for a simple clear explanation of Benford's law for real valued data sets. A point missing in the discussion is that for real valued data we know that BL corresponds to a 'log uniform modulo 10' distribution. This should probably be acknowledged.

The English in the manuscript is awkward in many places and could be edited by an independent author for grammatical correctness.

Fewster, R. A simple explanation of Benford's Law. The American Statistician 63, 26{32 (2009).

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 811, 2015.