

## ***Interactive comment on “Earthquake and hurricane coupling is ascertained by ground-based laser interferometer and satellite observing techniques” by M. N. Dubrov et al.***

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Reply to the interactive comment of Anonymous Referee #2

Anonymous Referee #2 confirms the idea that “hypothesis behind this manuscript is scientifically interesting and deserves to be investigated”, that “the measurements are sound and the observations highlighted in this manuscript deserve further (quantitative) investigations”. Meanwhile his interactive comment contains excessively rigorous and often not veridical criticism.

The major his comment is trouble “in finding a quantitative analysis about the claimed

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hurricane/earthquake coupling; the manuscript is too qualitative to support the statements”.

There are the next quantitative information and comments in the manuscript: (a) - rates of 10(18)-10(19) joules per day for the most powerful hurricane (typhoon) of the highest Category 5 SSHS correspond to energy orders of the strongest earthquakes with magnitude  $M = 8-9$ , page 939, line 8; (b) - spreading velocities vary from 30–60 kmh<sup>-1</sup> if they are recorded deep into the continental zone and up to 250 kmh<sup>-1</sup> – nearby the coastal region, page 940, line 25; (c) - processes proceeded for more than 50 h and were not recorded ever more during for all 6 month cycle of those observations, page 945, line 7; (d) - components at frequencies F18 and F26 in 1–3 Hz band . . . 1.94 Hz and 2.79 Hz in this band are about 64 relative units . . . their amplitudes diminished more than 7 times . . . became almost invisible in random background with amplitudes of 9–10 units, page 946, line 21-27; (e) - pressure depressions (up to 100–200 mbar) in hurricane or typhoon active zones. The strain-baric coefficient was found to be 2 10(-8)–2 10(-9) mbar-1 at the depths 2–15 m under earth surface, page 949, line 3. By the way the comment (e) just allows one to obtain the range of earth strains such as 4 10(-6)–2 10(-7), which are 1-2 order higher than tidal strains that have been already recognized to be the triggering cause of strong earthquakes (Sobolev and Ponomarev, 2003).

The Referee’s comment: “A sentence . . . “deformation (tilt and strain) precursors are often accompanied by the peculiar tremor precursors, which are known as a reducing of micro-seismic and acoustic noise background before earthquakes” is not supported by any material in this manuscript (instrumental or bibliographic)” can be parried by adding the necessary references. For example, “tremor precursors, which are known as a reducing and synchronization of micro-seismic noise background before earthquakes (Dubrov and Alyoshin, 1992; Sobolev and Ponomarev, 2003; Sobolev, 2011)”.

It is the problem to reply to uncertain comments and mere verbiage like those - “poor quality of the English”; “images and graphs are not self-explanatory”; “the manuscript

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itself is not mature" etc. On the contrary, if unjustified comments are specifically defined they are easy to parry.

Referee #2: "The use of "quite similar to" belongs to a personal note or a working report, not to a scientific publication".

In the Interactive Open Access Journal - Natural Hazards and Earth System Sciences (NHESS), publication 2003, 3, 757–776 (the authors are from UK and Greece) one can read: "data are quite similar to" (p.763), "model is quite similar to" (p.765), "results are quite similar to" (p.770). There are similar expressions in NHESS, 2001, 1, 165–170; NHESS, 2003, 3, 663–682; NHESS, 10, 1443–1455, 2010; and other scientific editions and publications.

Referee #2: "The use of "calm before the storm" is a popular saying and does not belong to the scientific vocabulary of a modern manuscript".

Journal of Geophysical Research: Space Physics - Volume 114, Issue A11, November 2009: "When there is a calm before the storm, the electron number density decays"; Volume 111, Issue A7, July 2006: "The calm before the storm in CIR/magnetosphere interactions". Journal "FIRE ENGINEERING", May 2013, v. 166 (5) p. 24-26: "Calm before the storm: FDNY preplanning and preparation", NEW YORK (USA), etc.

Referee #2: about a "strong remote earthquake  $M = 8.1$  in the southern hemisphere"; this is a very imprecise information. The authors should provide the date and the location of the earthquake. Also, "M" should be " $M_w$ ".

The earthquake  $M = 8.1$  (25 March 1998, Balleny Islands,  $M = 8.1$ , info provided on the page 944, line 1) was the strongest earthquake on the whole 1998 according to the NEIC (USGS) data <http://earthquake.usgs.gov/regional/neic/> Russian Geophysical Survey gives earthquake magnitudes  $M$  on the next waves:  $M_s$ ,  $M_b$ ,  $M_p$  [ftp://ftp.gsras.ru/pub/Teleseismic\\_Catalog/](ftp://ftp.gsras.ru/pub/Teleseismic_Catalog/) US Geological Survey gives magnitudes  $M$  on the next waves:  $M_w$ ,  $M_s$ ,  $M_b$ ,  $M_d$ ; (earthquake 25 March 1998, Balleny Islands,

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had  $M_s = 8.1$ ) The mere expression  $M$  for magnitude is used to avoid the muddle in manuscript.

The complete reference for (Yaroshevich, 2010): Yaroshevich, M.I.: Intra-annual dynamics of seismic activity in the cyclonic zone of the northwestern part of the Pacific Ocean, Doklady Earth Sciences, Volume 431, Issue 1, pp 409-412, 2010.

The complete reference for (Trubitsyn et al., 1976): Trubitsyn, A. P. and Makalkin, A. B.: Deformations of Earth crust under effect of atmospheric cyclones, Izvestiya AN SSSR, Fizika Zemli, N5, pp. 94-96, 1976 (in Russian) <http://www.ifz.ru/en/i-otdelenie/lab-101/trubitsyn-ap/>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 935, 2014.

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