

## ***Interactive comment on “Atmospheric Torques and Earth’s Rotation: What Drove the Millisecond-Level Length-of-Day Response to the 2015–16 El Niño?” by Sébastien B. Lambert et al.***

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In this paper the largest El Niño/Southern Oscillation (ENSO) events of last forty years are investigated in their association with a significant (almost 1 ms) increase in the length of day (LOD).

Mountain and friction torques are estimated from available datasets and it is “found that: (i) as a mixed Eastern/Central Pacific event, the 2015-16 mountain torque was smaller than for the 1982-83 and 1997-98 events which were pure Eastern Pacific events, and (ii) the smaller mountain torque was compensated by positive friction torques arising from an enhanced Hadley-type circulation in the Eastern Pacific, leading to similar

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AAM/LOD signatures for all three extreme ENSO events. The 2015-16 event thus contradicts the dominant paradigm that mountain torques cause the Earth rotation response for extreme El Niño events.”

The presentation is neat and synthetic.

The addressed topic and the proposed results are interesting.

Just one remark: according to my own experience in estimating form-drag the sensitivity of the computed drag with respect to resolution of the adopted mountain representation can be relevant in areas where mountains are steep. The only mention I found in the paper of the mountain drag computation procedure is “For computation of the mountain torque, we used the model orography. The longitudinal gradients of the pressure field were computed with a five-point stencil.”: more detail could help the reader. Was the dependence of the estimated drag on resolution checked?

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