

Interactive comment on “Earthquake static stress transfer in the 2013 Valencia Gulf (Spain) seismic sequence” by Lluís Saló et al.

Anonymous Referee #2

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I think that the problem raised in the manuscript is potentially of broad interest for SE readers and the scientific community, and should be considered for publication. However, reading this manuscript I am confused about that if it is at all possible in the form presented here. First of all the aim of the work is not clearly presented and the final conclusions are also not stressed and strong enough. Authors admit that future studies are needed when additional data will be available. But my main concerns is the proposed methodology to check the contribution of the mapped faults in the analyzed seismic sequence in the Valencia Gulf. I understand the first component of work to consider possible cause of interactions among seismic events as static stress transfer. Authors focus on the cumulative changes in stress due to the consecutive seismic events in the analyzed series. The cumulative stress changes are calculated after the occurrence of each event according to location and faulting type of the next event

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in the series. Although for this part I have some comments which I provide below, I think this part after improvements would be ready for publishing. The problem is with the two other goals, if I identified them properly: the contribution of mapped faults in the seismic sequence and the contribution of static stress changes in the seismic cycle of these faults. If the Authors assumed to consider their own Focal Mechanisms (FM) and depths of events (from 3 to 11 km) how is the sense to resolve the stresses of these events from the depth of these events on the mapped faults planes at the depth of these faults and at the same time hypothetically expecting that maybe these mapped faults contribute in the slip of the whole sequence. In my opinion if they could contribute they first should correlate with the parameters of the following seismic event in the sequence and second, if the range of the depths of events in the sequence is consistent and similar FM of events are as we see in Table B1, mapped faults had to experience the Coulomb Failure Function changes from the events at similar depths as they are. We know that the depth factor plays very important role in the CFF changes (DCFF) analyses. The consistency of the depth of events in the sequence is easy to be proven by the normalized signal cross-correlation (e.g. Schaff P. and Waldhauser F., 2005). Looking at the Table B1 one can notice that the FM of events are not so different to each other. Based on the idea that signals of events with close hypocenters and similar FM recorded on the same station are very similar, the signals cross- correlation analysis may indicate the possible differences in recorded signals either due to events' different depths or focal mechanisms. Moreover, this analysis may reveal some highly correlated pairs within events group. Did the Authors perform such kind of analysis? The same problem I see with the cumulative CFF changes impact on the seismic cycle of the mapped faults. If the mapped faults experienced CFF changes due to events on shallower depths the values of CFF changes would be quite different. More detailed comments in attached supplement.

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/se-2016-146/se-2016-146-RC2-supplement.pdf>

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Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-146, 2016.

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