

## ***Interactive comment on “Evidence of preliminary prognosis of appearance of catastrophic earthquake and strong tsunami in the region of Tarapacá, Chile” by Raissa K. Mazova et al.***

### **Anonymous Referee #2**

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The present article apparently attempts to show that the earthquake and tsunami that took place on April 1st, 2014 near Pisagua, Chile had been predicted by an earlier article of some of the authors.

I consciously stress that they \*apparently\* intend to do so, because the article itself lacks clarity on this regard and this could be only inferred from the title and a passing comment on the later stages of the article. It is hard to find other evidence for such claim other than a brief reference to earlier work. Whether these correlate is not established at all bar the fact that an earthquake occurred in a seismic gap.

Upon reading the article, moreover, it is difficult to understand its actual aim and ob-

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jectives. The article not only lacks a clear structure and line of reasoning (and leaving aside the very poor English grammar), but constantly offers a wide range of information that does not relate to the main topic, which obfuscates the reading. While doing this, sometimes elements are omitted without explanation, which is even more confusing. For example, when reviewing the history of Chilean seismicity, events such as those of 1922 and 1943 are omitted despite their importance. Tables and figures appear rather haphazardly and very often they have no explicit relation to the text.

In addition to these formal aspects, there are a few fundamental issues. The referencing is mostly dated and self-referencing. This would not be a problem per se, but in doing so the authors ignore a large body of research published since the occurrence of the earthquake and tsunami of interest. That research has done meaningful progress in characterizing these events. Several of these works touch upon topics that are closely related to the ones of the present article, and they do so with greater detail. To mention just a few:

Seismic source inversion Chen, K.; Babeyko, A.; Hoechner, A. & Ge, M. (2016), 'Comparing source inversion techniques for GPS-based local tsunami forecasting: A case study for the April 2014 M8.1 Iquique, Chile, earthquake', *Geophysical Research Letters* 43(7), 3186–3192.

Gusman, A. R.; Murotani, S.; Satake, K.; Heidarzadeh, M.; Gunawan, E.; Watada, S. & Schurr, B. (2015), 'Fault slip distribution of the 2014 Iquique, Chile, earthquake estimated from ocean-wide tsunami waveforms and GPS data', *Geophysical Research Letters* 42.

Schurr, B.; Asch, G.; Hainzl, S.; Bedford, J.; Hoechner, A.; Palo, M.; Wang, R.; Moreno, M.; Bartsch, M.; Zhang, Y.; Oncken, O.; Tilmann, F.; Dahm, T.; Victor, P.; Barrientos, S. & Vilotte, J.-P. (2014), 'Gradual unlocking of plate boundary controlled initiation of the 2014 Iquique earthquake', *Nature* 512(7514), 299–302.

Yagi, Y.; Okuwaki, R.; Enescu, B.; Hirano, S.; Yamagami, Y.; Endo, S. & Komoro, T.

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(2014), 'Rupture process of the 2014 Iquique Chile Earthquake in relation with the foreshock activity', *Geophysical Research Letters* 41, n/a–n/a.

Tsunami Modeling: Calisto, I.; Ortega, M. & Miller, M. (2015), 'Observed and modeled tsunami signals compared by using different rupture models of the April 1, 2014, Iquique earthquake', *Natural Hazards*, 1-12.

An, C.; Sepúlveda, I. & Liu, P. L.-F. (2014), 'Tsunami Source and Its Validation of the 2014 Iquique, Chile Earthquake', *Geophysical Research Letters* 41(11), 3988–3994.

Omira, R.; Baptista, M. A. & Lisboa, F. (2016), 'Tsunami Characteristics Along the Peru–Chile Trench: Analysis of the 2015 Mw8.3 Illapel, the 2014 Mw8.2 Iquique and the 2010 Mw8.8 Maule Tsunamis in the Near-field', *Pure and Applied Geophysics*, 1–15.

Tsunami modeling and resonant activity in the area

Catalán, P. A.; Aránguiz, R.; González, G.; Tomita, T.; Cienfuegos, R.; González, J.; Shrivastava, M. N.; Kumagai, K.; Mokrani, C.; Cortés, P. & Gubler, A. (2015), 'The 1 April 2014 Pisagua tsunami: Observations and modeling', *Geophysical Research Letters* 42(8), 2918–2925.

Cortés, P.; Catalán, P. A.; Aránguiz, R. & Belloti, G. (2017), 'Tsunami and shelf resonance on the northern Chile coast', *Journal of Geophysical Research* 122(9), 7364–7379.

It is therefore unclear why they are not considered at all. This poses a serious problem for the article as it adds no value to the current state of knowledge.

There are fundamental methodological errors as well. They use appear strike angle that bears no correlation with the physical configuration of the area under study, although it is not possible to know for sure from the data as presented, since for each block only the location and displacement are given. Moreover, they use a sparse set of sea surface elevation data to validate the modeling, omitting time series very close

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to the source such as that of Iquique and Pisagua. How it is possible to expect a valid source model omitting such relevant data?

With all these considerations, I consider that there is no alternative other than rejection of the manuscript.

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