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Ocean Science
Discussions

Interactive comment on "Coastal Sea Level rise at Senetosa (Corsica) during the Jason altimetry missions" *by* Yvan Gouzenes et al.

Anonymous Referee #1

Received and published: 27 March 2020

Review of the paper: os-2020-3 Title: Coastal Sea Level rise at Senetosa (Corsica) during the Jason altimetry missions

General assessment This paper addresses a relevant topic of research, the determination of local coastal sea level trends from satellite altimetry. The study focuses on a Jason track crossing Corsica Island at the Senetosa site. The analysed period spans 14-years (from July 2002 to June 2016). Altimeter data used include Jason-1 and Jason-2 20Hz measurements, ranges from the ALES retracker and corrections from the X-TRACK system. The main conclusion of the paper is that, provided altimeter-derived coastal sea level trends are reliable, these trends can be significantly different from the corresponding open ocean trends. Most effort is put in justifying that the results are not due to e.g., spurious trends in the geophysical corrections, imperfect intermission bias

estimate, decrease of valid data close to the coast and errors in waveform retracking. The paper is scientifically sound, generally well written and structured. The paper can be accepted subject to minor revision. A few suggestions are given to improve paper clarity.

Detailed comments: 1) MY major suggestion to authors is to include a discussion about the connection (or not) between the results in this particular site with the global results of the CCI project. Did they find many sites where coastal sea level is significantly different from that offshore? Is this a representative site or an exceptional result?

2) Since the main focus of the paper is trying to discard causes that might explain the observed trends, it is important to give enough detail on the altimeter data used and adopted processing, so that the reader can follow the discussion with enough information. For example, saying that that corrections are those adopted in the X-TRACK system is not enough. At least the corrections that most affect coastal sea level, in addition to the SSB, the wet tropospheric correction and ocean tides should be discussed in more detail. Information should be given, with appropriate references, on: i) models used (e.g., original wet tropospheric correction from the Jason GDRs (MPA algorithm from Brown ,TGARS 2010) or from GPD (Fernandes, RSE 2015)?; ii) tide model from FES2014 or any other model? How big are tides in this site?; iii) rate at which each of these corrections is provided (1Hz or 20Hz)? In case of 1Hz corrections interpolated to 20Hz, they don't have enough detail to cause differences in trends at scales of few km, discussed in this paper.

Fig. 2: The grey square is hardly visible. Please improve.

Section 4.1: please explain how the standard deviation of trends is computed.

Section 4.2. A more recent reference on coastal altimetry than that by Vignudelli et al., 2011 is the book chapter "Satellite altimetry in coastal regions" by Cipollini et al., 2017 in the CRC Press book. Please include.

Section 4.2.1 – “waves could has a” replace by “waves could have a”

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