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Ocean Science
Discussions

Interactive comment on "Sea Level Variability in the Swedish Exclusive Economic Zone and adjacent seawaters: Influence on a Point Absorbing Wave Energy Converter" *by* Valeria Castellucci and Erland Strömstedt

Anonymous Referee #2

Received and published: 30 May 2019

This paper presents an analysis of sea level variability in the Baltic Sea with its potential impact on the energy yields of some wave energy converter devices. The structure of the paper is good and the results are clearly shown with some novel information.

The main question that I am left with though is with regards to the wave energy component. Every site chosen for energy generation is determined by cost of energy, and this in turn is determined by the energy yield and cost of installation and maintenance. How much energy is actually available for the wave device in the region with a constant sea level and how much does the change in sea level affect this? I can't get a feel for how

much of an impact the change in sea level has from the data shown here. I don't even have a clear idea of the frequency of these large deviation sea level periods. Perhaps it would be useful to have a histogram of the sea levels at the representative location. It would be helpful if instead of a single design wave, the energy from a device across a representative wave field was shown and how this is affected by the changing sea level. The second related area, is that I am left questioning if the sea level changes have a major negative impact on the energy yield why use this type of wave device? You suggest that there are fixes to these problems in your discussion but why not just include these solution in all models? Presumably because of the cost? Some description of this would be helpful in providing a basis for justifying this particular energy device.

A more minor point is with regards to use of mean sea level. As far as I can determine you actually use the sea level as an hourly mean of your time series. This is obviously right for this context as the waves of interest are on much shorter timescales. However, when I read MSL I think of much longer term sea level. The tides are measured around MSL but this obviously doesn't change on an hourly basis, and the use of the terms in sea level rise is also obviously in a much longer context. It would be helpful to indicate the exact MSL you mean in your paper. Sometimes you use the MSL1h and others just MSL and the two are not generally interchangeable in a wider oceanic context.

Some typos

In the abstract on line 9 "linear systems with at a limited..." should remove the at

On page 2 and line 18 the final element in the list "pole tide" should have and the added before.

On page 5 the last word Ensemble is spelt incorrectly on line 2

On line 11 change the word have to has

On line 13 at the end of the line I think it should be sea level variations

On line 20 insert it into "one may find it preferable"

On line 33 where talking about the weight did you mean except the buoy rather than but the buoy?

On page 10 the second sentence of the Case Study section needs to be rewritten to make it clearer

On page 14 the addition of a in "the energy absorption as a function..." in line 31

On page 15 the word than should be then in line 1

At the end of line 20 I think that wave park should be singular

On line 20 an a should be inserted in "energy absorption as a function..."

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