

## ***Interactive comment on “A methodology for estimating the response of the coastal ocean to meteorological forcing: A case study in the Bohai Bay” by Daosheng Wang et al.***

### **Anonymous Referee #1**

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This study evaluates the relative success of different parameterisations of the static and dynamic response to meteorological forcing of sea level at two locations in Bohai Bay. The study tests the classic Inverse Barometer Correction, dynamic atmospheric correction (DAC), multivariable linear regression analysis and a new approach (the IBR) that combines the high frequency dynamic adjustment to atmospheric pressure with low frequency atmospheric pressure and wind components. This IBR adjustment is attempted using alternative regional and local atmospheric forcings and finds the regional IBR to afford the closest resemblance to sea level observations at the two locations.

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General comments: The paper is well written and the authors describe a clear and methodical approach. In that respect, I find there is little to fault in the quality of their analysis, but the study does lack some context, as there is little description of the local environment, climate and sea level variability. For example, does this area suffer from frequent storm surges and inundation? Are tidal ranges large, so that the combined effects of meteorological and astronomical forcings have been particularly damaging here? Without this context, it leaves the reader rather underwhelmed and wondering what is the relevance/importance of this study to the local area and to the wider scientific community?

A few further comments: P1 Line 10 (Abstract) Perhaps replace “substantially contributed” with “dominated by”?

P 1 line 29 the second use of “sea level” can be abbreviated to “SL”

P2 line 4 replace “which makes the response be poorly accounted for” with “which is a poor representation of the response”

P4 line 14. The reported accuracy of the instrument ( $\pm 5$ cm) concerns me as this study is evaluating cm-scale sea level responses. GLOSS standards recommend the use of data with instruments with accuracy of  $\pm 1$ cm. Given this reported accuracy, it would be helpful to know whether any quality assurance processing had taken place (and if so what) using the underlying sea level observations.

P5 line 9 (and elsewhere in the paper) Confidence levels are not given for the correlations. These should be specified in the text and tables.

P6 line 17 “regional ASL” is misleading and would be better described as “regionally adjusted SL”

P7 line 10 replace “smaller” with “lower”

P8 line 5 should read “As the ocean has a dynamic response”

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