Nat. Hazards Earth Syst. Sci. Discuss., 1, C3064–C3067, 2014
www.nat-hazards-earth-syst-sci-discuss.net/1/C3064/2014/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Preliminary investigation on the coastal rogue waves of Jiangsu, China" *by* Y. Wang et al.

Y. Wang et al.

wyeureka@sina.com

Received and published: 23 April 2014

Comment 2-1: The study uses buoys measurements to study the height of individual waves. While buoys provide accurate integrated spectral parameters, wave height is less accurate than those measured by other devices. (see, e.g., Forristall, JPO 2000, and references therein).

Response: Thanks to the reviewer. This question has already been answered in the last review process. I put the answer again as following. There do exist some limitations to study rogue waves via buoy data as mentioned by the reviewer. However the buoy is currently the popular instrument for wave measurement, at coastal ocean or in the deep sea. This study used self-developed wave buoy for rogue wave study. A strapped-down

acceleration meter is installed in a buoy for motion measurement and assumed as the water particle track. Surface movement is inversed from displacement spectrum that transferred from acceleration spectrum. The uncertainty of the measurement comes from the response of the buoy with sea surface. Buoy size, mooring line and the sea state are the factors of wave following capability. Small buoy like used in this study has better wave following motion in moderate or calm seas. Mooring line drag in strong currents is significant. Drag increases with square of current speed and exposed area of the mooring line. For small buoy, we used rubber cord for mooring in order to have better wave following capability. In addition, we deploy the buoy with 40m mooring line length that is 4 times of the water depth of buoy location. Actually the tidal current at the buoy location is between 0.1 to 0.6 m/s, showing the current drawing effect is relative small. The sampling rate is increased to 4Hz comparing to typical designed 2Hz. This is to increase the capability of recording an entire wave profile for rogue wave study. Corresponding approaches have been carried out to reduce the uncertainty of buoy measurement on individual wave shape. Baschek and Imai (2011), Cavaleri et al. (2012), Pinho et al. (2004), Divinsky et al. (2004), Doong et al. (2010), Lee et al. (2011), Liu et al. (2009), Liu and Pinho (2004) all used buoy data for rogue wave studies.

Comment2-2: Only 17.067min time series an hour are used. This does not provide a long enough records for the measurements of statistical parameter such as skewness and kurtosis, which on the contrary requires very long series to be statistically significant. I doubt that the values obtained are reliable.

Response: Due to the electricity, storage capacity and other reasons, it is a compromised method to just get 17min time series. While it is also a classical approach for wave statistics, as reference Mori et al 2002. We can not stop our research and just waiting for longer enough time series. Of course, we need do a lot research works to make sure the data is reliable and the details are provided in 'wave data' section.

Comment2-3: Records only show very mild sea state conditions, with Hs<1m. Al-

though the definition of a rogue waves is dimensionless, the overall dimension of the sea state cannot be disregarded. Are these measurements really representative of a storm condition? It would be more interested to see a broader range of measurements with larger significant wave height.

Response: It is true that our records are not so very large due to the broad silt bottom slope, while there are still many cases with Hs>1m, which can be seen clearly in Fig. 10. Our emphasis is on the rogue waves, not the storm waves. Lots of evidences have shown the rogue waves also can be present without storm. The details can be referred to Tao 2012.

Comment2-4: At page 6600 there is a description of wave steepness. Does this relate to the spectral peak or does it refer to individual waves? This is an important detail for understanding the results.

Response: Thanks to the suggestion. The wave steepness is for individual waves. We make a new table Tab.2 to show the details.

Comment2-5: At page 6600 there is a discussion on BFI. This is a parameter that refers to unidirectional sea states and it is completely meaningless in the present study, which considers realistic directional waves.

Response: Of course there are lots of different mechanisms related to unidirectional and random sea. But, physically, there do exist basic common mechanisms. A lot of references, such as Xiao Wenjing(2013) , have shown the meaning of BFI to random waves, particularly in deep water, since modulation instability is the dominate mechanism there. While, most of the records shown here are present in intermediate water depth.

Comment2-6: Authors suggest existence of rogue waves with H/Hs > 2.5. I find it hard to believe that this can really happen in stormy conditions. Such waves would definitively break before reaching such an incredible ration.

Response: This question can be solved via lots of references, such as Liu(2008). While from our results, it is just a preliminary suggestion. And we will do more research works on that.

Comment2-7: I do not understand the discussion on the wave recorded in September 2011. While there is no specific date associated to the time series, forecast/hindcast on 2 Sept. is claimed as relevant. How can this be so?

Response: This paragraph dose exist mistakes. We have cancelled this part after we checked this time series in more details. We agree that this may not be generated by the real sea. Maybe it induced by a big ship. But it makes no influence to this section and the whole idea.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 6593, 2013.