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Ocean Science Discussions

Interactive comment on "Co-existence of wind seas and swells along the west coast of India during non-monsoon season" *by* R. Rashmi et al.

Anonymous Referee #2

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Within this paper, an analysis of three wave temporal series collected during non-monsoon season at three different points along the Western coast of India is presented. The analysis consists in (i) separating wind waves and swell from observed directional wave spectrum, in (ii) estimating the predominance of each class of waves and (iii) fitting a formula relating wind speed to significant wind sea wave height and peak period. Technically speaking, the methodologies employed are not new. However, their application to these wave data allows gaining a better understanding of the wave dynamics at three locations along the Indian coast. The overall paper is well written although the paragraph "results and discussion" should be reorganised to gain clarity.

General comments:

The results presented in the paper offer a description of wave conditions for different

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locations along the western Indian coastline. The authors draw strong conclusions about the wave climate during non-monsoon season. However, these conclusions need further investigation. I wonder whether the selected periods of measurements are representative of the actual wave climate. Are three months of measurements sufficient to characterise the climate of wind waves and swell? Moreover, observations at one location are assumed to be representative of the entire western Indian coastline. That is an important assumption, given the distance between the three considered locations. Is there any evidence that could confirm this assumption? Eventually, a last comment, which is probably out of the scope of the current study, would concern the tidal effect on waves at locations where the water depth is 15m. A spectral analysis of the significant wave heights and peak periods would be beneficial to exhibit the diurnal and/or semi-diurnal effects on waves.

Specific comments:

1. Page 3100, I would recommend to remove the "cos2s(theta/2) " (l.19), E* (l.24), X* (l.25), fp* (l.25), unless they are defined. At the end of the paragraph "results and discussion", a relation between non dimensional energy and non dimensional peak period is presented. Is it possible to find a similar relation between the dimensionless fp and X*, to compare with the one stated in the literature review from Kahma (1981).

2. Sentence "As the situation is similar. . ." (Page 3101, line 1 to line 2) states a method used by the author to estimate the fetch. I recommend this line to be moved at the end of paragraph "Data and Methodology", and some explanation about this method should be added.

3. On page 3101 Line (22), shamal swells could be described in more details, for non-specialists of the Arabian Sea. Moreover, I would recommend these events, if they took place during the measurements, to be represented on the temporal series presented on Fig.2 and on Fig.3.

4. Variables Hs, Tz are introduced. They are usually considered as integrated wave

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parameters computed from the total wave spectrum. Here, I found odd the notation Hs(f) and Tz(f). I would recommend to remove eq (1) and (2) and to only keep eq. (3), although ksi is not a function of f, but of fl and fu. Moreover these equations are for unidirectional wave spectrum. Since the authors collected directional measurements, I wonder what was done to the directional information. I would appreciate that the authors state if any preprocessing have been performed prior computing eq (3).

5. I wonder how good equations 3 and 4 are to estimate fs in case of more than two peaks in the wave spectrum, as it is the case on fig. 5a and Fig.6a.

6. On page 3104, eq. (7), the peak frequencies for swell and wind sea are introduced. How are these peak frequencies computed? If the method of maximum is considered, have the authors found the method to be stable?

7. For readability, section "results and discussions" should be subdivided. I propose the following subsections: diurnal variability, relative importance between swells and wind waves, waves directionality, swell age, fetch analysis. These subsections could be done for each location individually and eventually a latter section could summarise the comparison between locations and seasons.

8. On Fig.2, the diurnal variations are present at each location. However, the authors state that at some locations (or for some seasons) these variations are more or less significant. A more quantitative comparison would beneficial. Could the authors consider a spectral analysis of the temporal series?

9. What is the water depth on Fig.2? Fig.2 is used to explain the statement line 1 to 4 on page 3106, although this figure only represent the temporal series at one particularly water depth.

10. From the SSER, it appears that at the point Ratnagiri waves behave with water depth differently when compared to the two other locations. At Goa and Dwarka, swell importance increases as the water depth decreases and inversely the wind sea in-

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creases with water depth. At Ratnagiri, this behaviour is not apparent. Is this related to the numbers of peaks in the wave spectrum (page 3107 line 24) and the methodology used for spectral separation? At least this difference should be highlighted in the conclusions.

11. On Fig.8, the authors plotted the function from eq. 9. Since the x-axis and y-axis are the same on the three panels, the line, representing eq. 9, should be the same in these three panels.

Interactive comment on Ocean Sci. Discuss., 9, 3097, 2012.