

Interactive comment on “The wave spectrum in archipelagos” by Jan-Victor Björkqvist et al.

Anonymous Referee #2

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General comments: The authors have analysed a large number of wave observations from a complex shoreline structure, the Finnish archipelago. The paper has many interesting results worth while to publish, like the relation between $H_{1/3}$ to H_s , the discussion on critical frequency versus peak frequency, how the shape of the spectrum flattens when going more inside the islands. Several interesting parameters are used in the analyse, i.e. the critical frequency from Young (1995), the spectral narrowness parameter κ^2 from Battjes and van Vledders (1984), the degrees of freedom (d.o.f.) from Donelan and Pierson (1983), and the paper has some good results using these, certainly worth while to publish. But the paper is difficult to read. It needs a considerable rebuilding. Motivation is only vaguely mentioned in between a number of references to different papers showing the authors have done a good research in this analysis. The database seems to have important weaknesses. The data in the inner and sheltered zones have average H_s of around 20 cm decreasing to 2-5 cm. And it seems they are

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measured with buoys with 40 cm diameter. With sampling frequency 1.28 Hz. And the measuring period is only 14-31 days for these. Can such measurements be at all reliable? The authors do deal in what is a second part of the paper with mostly with T2 versus GoF, where measuring period is 2-3 years. But this should be more clearly stated in the paper.

Specific comments: The paper should be rewritten for an easier access of results to community. Only a few comments are given here.

Regarding motivation: It is believed that questions to answer is how much of offshore wave energy enters through the islands, and in what form (distribution in frequency, spectral shape...). Reduction factors are mentioned, without saying how many cases are involved. How is low frequency energy reduced inside the archipelago?

The paper is difficult to read for several reasons. Site description: an overview map is needed for the understanding of fetches. I would suggest one with only land contours, and perhaps the 40m and 80m isolines would help, covering the area of importance for the GOF and T2 point. The map in figure 1 is difficult to 'read' because land has a colour difficult to identify in between strong variations in depth.

The overview of the database in Table 1 comes too late. Names of stations are given in the text here and there, the identifications ('T1', 'T2') would help to be given together with the names.

Database: What conditions do we have in general at the two sites with wind measurements, a) for the 2-3 year period in last part of paper, and in the periods where the inner sites are included.

Technical corrections No details at this point.

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