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Forecasting extreme wave events in moderate and high sea states

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Empirical studies on measurements have not yet come to conclusive relations between occurrence of rogue waves and - parameters which could be forecasted . Theoretical and tank experiments have demonstrated that high spectral peakedness and low spectral width combined (high Benjamin-Feir instability index, Onorato et al., 2006) give higher probability of rogue wave occurrence. Directional spread seems to reduce the probability of occurrence of rogue waves in these studies. Many years of experience with forecasting and discussions with people working in ocean environment indicate that rogue waves may as well occur in crossing seas. This was also indicated in a study in the Maxwave project (Toffoli et al., 2003) and the EXTREME SEAS project (Toffoli et al., 2011). We have here experimented with some indexes describing both high BFI and crossing seas and run the WAM model for some North Sea storm cases. Wave distributions measured at Ekofisk are analysed in the different cases.

References

• Onorato, M., Osborne, A., Serio, M., Cavaleri, L., Brandini, C., and Stansberg, C.: Extreme waves, modulational instability and second order theory: wave flume experiments on irregular waves,Europ. J. Mech. B/Fluids, 25, 586–601, 2006.

• Toffoli, A., Lefevre, J.M., Monbaliu, J., Savina, H., and Bitner-Gregersen, E., “Freak Waves:Clues for Prediction in Ship Accidents?”, Proc. ISOPE’2003 Conf. Hawai, USA, 2003.

• Toffoli A., Bitner-Gregersen E. M., Osborne A. R., Serio M. Monbaliu J., Onorato M. (2011) Extreme Waves in Random Crossing Seas: Laboratory Experiments and Numerical Simulations. Geophys. Res. Lett., Vol. 38, L06605, 5 pp. doi: 10.1029/2011.