



## **Freak waves on collinear current jets**

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It is well known that waves grow taller when they meet a current in the opposite direction, and become less tall when they meet a current in the same direction.

We have studied the statistical distribution of waves encountering a collinear current jet (applicable to e.g. the Aghulas current, river estuaries or tidal flows in the coastal zone). Monte-Carlo simulations have been performed employing a modified nonlinear Schrödinger equation including the effects of current.

Freak waves are traditionally defined by the amount of extreme waves relative to average waves in a time series measured at one location. According to such definitions, we find that the amount of freak waves decreases as the waves grow taller in the centre of an opposing current jet, while the amount of freak waves increases on the sides of the jet where waves attenuate. Similarly, for waves on current jets in the same direction, the amount of freak waves increases in the centre of the jet where the waves become smaller.

Freak wave statistics may therefore be misleading as far as navigation on current jets is concerned.