



## **Internal waves and internal solitons shoaling and breaking along a continental slope.**

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Measurements in the Ormen Lange area, at the continental shelf slope outside mid Norway, have revealed several occurrences of high speeds near the seabed often connected to temperature or salinity variations.

Bergen Ocean Model (BOM) has been set up with idealized topography (linear slope) to investigate if internal waves or internal solitons can lead to the measured events. These kind of waves exists in all oceans and can propagate for hundreds of kilometers without significantly losing the amplitude, the generation area does not need to be located close to where the shoaling occurs.

The numerical results show that the shoaling of internal waves or solitons along a shelf slope can lead to breaking and generation of boluses that can propagate up the slope. During these events the maximum horizontal velocity of the wave can be intensified up to almost 10 times. The results also show that the maximum velocity during a breaking and run up event depends on the amplitude of the wave and the steepness of the slope. The combination of a gentle slope and a internal wave with big amplitude leads to the highest velocities. These velocities is shown that can exceed 1.0 m/s when the internal wave or the internal soliton have an amplitude of 100 m and the slope is 0.05.