



## **Tidal Resonances on the Northwest European Shelf**

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The resonance is a phenomenon that has been studied a lot, mainly in mechanics and electricity. It can be defined as an amplified response of the system to a forcing whose frequency matches the natural frequency of the system, and can account for the very high tidal ranges near coasts of peculiar shapes, such as gulfs. Famous examples for that are the Gulf of Maine and the Bristol Channel, but many other places exhibit resonance behaviour. The theoretical aspect of resonances has led to the use of models to study it.

A numerical model of the North-West European Shelf is used here, which has the particularity that it can be run for complex frequencies. This allows us to identify the resonance peaks even when they are smooth because of frictional damping.

We investigate, using an idealised numerical model of the English Channel, the impacts of the Coriolis force, the friction and the dimension of a basin on resonances, to identify the main parameters that can be used to characterise the resonance.

We then use these parameters to give a theoretical support to the identification of some of the resonant modes of the North-West European Shelf.