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Theoretical modelling of ice shelf vibrations forced by ocean surface waves

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Seismic measurements show that ice shelves vibrate in response to ocean surface waves over a wide frequency range, from long swell to tsunami waves. The phenomenon of wave-induced ice-shelf vibrations has been linked to calving of large icebergs, rift propagation, icequake activity, and triggering of catastrophic disintegrations. I will present some recent advances in theoretical modelling of wave-induced ice-shelf vibrations, including coupling of the ice shelf/sub-shelf cavity to the open ocean, studying the influence of ice-shelf thickening and seabed shoaling towards the grounding line, simulating transient vibrations in response to incident wave packets, and incorporation of real ice-shelf and seabed geometries via the BEDMAP2 dataset. I will introduce the open-source software iceFEM, which contains many of the latest advances.