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**Meteotsunamis and other anomalous “tidal surge” events in Western Europe in summer 2022**

We investigate occurrences of anomalous tidal activity in coastal waters of northwest Europe during Summer 2022. Sightings of an anomalous “tidal surge” occurred on 18 June 2022 in Wales, followed by similar observations in Ireland, France, and Spain. Several anomalous long wave events were also reported in south England and Wales in the morning of 19 July 2022. We analyse surface and high-altitude air pressure fields, and sea level oscillations for both days. Our detailed analysis reveals that the 18 June events were a series of meteotsunamis, propagating over several countries in western Europe and triggered by localised pressure perturbations, originating within a low-pressure area over the North Atlantic Ocean.

Local analysis for the southern coast of Ireland suggests that Proudman resonance was the determinant mechanism that amplified the meteotsunami travelling eastwards in the afternoon of 18 June. A similar analysis for the 19 July events suggests that the “tidal surge” reported in the UK and anomalous signals recorded in Ireland and France were episodes of seiching triggered by infragravity waves, resonated subharmonically by wind waves. Numerical simulations of the 18 June event were performed with Volna-OP2, which solves the non-linear shallow water equations using a finite volume discretisation.

This is joint work with Emiliano Renzi, Claire Bergin, Tatjana Kokina, Daniel Santiago Pelaez-Zapata and Daniel Giles.