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**Tuesday, December 15, 2020, at 10:00 (Boston)
15:00 (UK/Eire) 16:00 (C.Europe) 23:00 (China)
Mathematical Picture Language Seminar**

Zoom at: <https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUIJVzZqT3lwV2pCT1ZUQT09>

**Topology in shallow-water waves: A violation of bulk-edge
correspondence**
Gian Michele Graf, ETH Zurich

Abstract: A two-dimensional rotating shallow-water model describes a layer of water, in guise of oceans covering the Earth. It is formally analogue to a Schrödinger equation where the tools from topological insulators are relevant. Once regularized at small scale by an odd-viscous term, such a model has a well-defined bulk topological index. However, in presence of a sharp boundary, the number of edge modes depends on the boundary condition, showing an explicit violation of the bulk-edge correspondence. We study a continuous family of boundary conditions with a rich phase diagram, and explain the origin of this mismatch. Our approach relies on scattering theory and Levinson's theorem. The latter does not apply at infinite momentum because of the analytic structure of the scattering amplitude there, which is ultimately the reason for the violation. (Joint work with H. Jud and C. Tauber.)

