

Topographic Rossby Waves in a realistic numerical ocean simulation

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Recently, topographic Rossby Waves have been identified from moored observations on the northern Iceland continental slope. The waves appear to have an offshore energy source somewhere, but the (spatially limited) observations cannot tell us exactly where this energy comes from, how the waves are generated, where they go, whether topographic Rossby waves are unique to this specific location or that they are a ubiquitous feature in this part of the ocean, etc.

Using the output of a realistic, high resolution setup of the MITgcm for the region southeast of Greenland – including Iceland – we will search for topographic Rossby waves, and use the model solution to study the properties of these waves. Once we have identified what they look like and where they are found, we can progress in a number of directions depending on what we find. For example, we could focus on how these waves affect the mean flow, how the properties differ in a nonhydrostatic model solution, where the wave energy comes from, or a different set of questions arising from the analysis and/or the student's interests.

For the model analysis, we will make use of SciServer (<http://www.sciserver.org/>), which hosts the datasets, and a Python package called OceanSpy (<https://oceanspy.readthedocs.io/en/latest/>).

References:

Harden, B. E. and R. S. Pickart (2018): High-frequency variability in the North Icelandic Jet. *Journal of Marine Research*, Vol. 76, pp 47-62.

Rhines, P. B. (1970): Edge-, bottom-, and Rossby waves in a rotating stratified fluid. *Geophysical Fluid Dynamics*, Vol 1, pp 273-302.