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Understanding the variability of the Eddy Kinetic Energy in the Arctic Ocean.

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Mesoscale activity in the Arctic Ocean remains largely unexplored, owing primarily to the challenges of i) observing eddies in this ice-covered region and ii) modelling at such small deformation radius. In this talk, we will use results from a simulation performed with a high-resolution, eddy resolving model to investigate the spatial and temporal variations of the eddy kinetic energy (EKE) in the Arctic Basin. On average and in contrast to the typical open ocean conditions, the levels of mean and eddy kinetic energy are of the same order of magnitude, and EKE is intensified along the boundary and in the subsurface. On long time scales (interannual to decadal), EKE levels do not respond as expected to changes in the large scale circulation. This can be exemplified when looking at the spin up of the gyre that occurred in response to a strong surface input of momentum in 2007-2008. On seasonal time scales, the estimation of a Lorenz energy cycle allows us to investigate the drivers behind the peculiarities of the EKE field, and to understand the relative roles played by the atmospheric forcing for them.