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Statistical analysis of oceanographic fields in Fram Strait

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We perform a statistical analysis of temperature and velocity fields in Fram Strait, the deepest passage between the Arctic Ocean and the North Atlantic. Time series of velocity and temperature exist for an array of moored instruments across the gateway at 78.8°N since 1997.

Our analysis reveals a strong variability of both parameters on different time scales. Since the spatial resolution of moorings is coarser than the local Rosby radius, the array does not resolve mesoscale motion like eddies. Correlations between neighbouring instruments are relatively high in vertical and significantly lower in the horizontal direction. The higher vertical correlation for current velocity between instruments at single moorings, particularly in the West Spitsbergen Current, reflected a prevailing barotropic structure of the flow. The higher horizontal correlations in the central part of the strait on longer time scales can be linked to the Atlantic water recirculation.