Eddy overturning across a shelf edge front has been investigated in a simplified model setup comprising an along-slope uniform shelf and slope with a slope current, and is initiated with temperature and salinity data collected off Kongsfjorden at Spitsbergen. The model results illustrate how eddy overturning act towards flattening cross-slope density gradients. Clockwise eddy overturning combined with atmospheric cooling may have lead to an efficient cooling of the West Spitsbergen Current during the late winter seasons of 2007 and 2008.

The numerical domain consists of a shelf and shelf slope that is uniform in the north-south direction. A cyclic boundary condition is applied in the north (the outflow in the north enters the domain through the southern boundary). The initial density fronts are based on hydrographic data from the standard transect outside Kongsfjorden, shown in Figure 1 [TN09]. MITgcm was used for the numerical simulations, which were run on the HPC-cluster - Stormstorm at the University of Tromsø.

The model runs are initiated with two source profiles taken from real data. Comparisons between the modeled fronts and original data are done via a concept we call Atlantic Water fraction, $F_{AW}$:

Atlantic Water fraction: Fraction between source profile of Atlantic Water and Shelf Water, assuming mixing occur along isopycnals.

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