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Interactive comment on "Norwegian Atlantic Slope Current along the Lofoten Escarpment" *by* Ilker Fer et al.

Michael A. Spall (Referee)

mspall@whoi.edu

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This is a timely analysis of mooring data within the Norwegian Atlantic Slope Current on the eastern side of the Lofoten Basin. This region has been identified as a source of eddy kinetic energy and offshore eddy heat flux, which is important for the basin-scale stratification and air-sea exchange. The analysis is fairly straightforward and I recommend that it be published subject to relatively minor revisions. There are a couple suggestions for additional analysis that, while not crucial, would provide more context for the results.

Would it be possible to compare the transport in density and depth with that at the Svinoy section? If the transport there is barotropic, and here it is baroclinic, that implies

that there has been some upwelling between these two stations, or a loss of transport in the deeper layers. If the transports are similar, can you tell if the isopycnals have risen or if there has been a water mass transformation between these two sections? I think a more complete comparison with that upstream section can reveal more about what has happened between these locations. Even if the years are different, maybe you can consider the seasonal cycle, which should be representative.

Can the authors provide error bars for the velocity and transport estimates?

Introduction:

You might also reference Clark and Straneo (Observations of Water, Mass Transformation and Eddies in the Lofoten Basin of the Nordic Seas, JPO, 2015).

I had a 2010 paper in Ocean Modeling that would be more appropriate to reference than the 2010 JPO paper as it addresses the lateral eddy heat flux in (an idealized) Lofoten Basin (Spall,Non-local topographic influences on deep convection: An idealized model for the Nordic Seas, Ocean Modeling, 32, 72-85).

lines 120-124: It should be possible to quantify the source of the increased vertical shear, or at least break it down into temperature and haline contributions via thermal wind.

linbe 157: It might be useful to provide a scaling for the expected response to changes in the wind stress. One could calculate the onshore Ekman transport, downward deflection of the isopycnals, and the geostrophic response. The paper by Choboter et al. (2011, Exact Solutions of Wind-Driven Coastal Upwelling and Downwelling over Sloping Topography, JPO, 41, 1277-1295) provides analytic solutions but you might be able to do something useful just with simple scaling.

line 191: It seems likely that the transport variability is due to the current meandering outside the moorings (rather than a change in the along-slope transport), but this isn't explicitly mentioned.

Figure 7: I found this to be the most surprising part of the paper. Any ideas why there is more warm water in winter than in summer? When/where was this water last exposed to the atmosphere? Was this subducted in the previous summer? If you see the same phase at Svinoy, which is O(1000 km) upstream, that would argue against it simply being advected along the slope. I think some more discussion around this finding would be helpful. The penetration of AW down to 650 m depth is likely related to that being the sill depth upstream.

line 232: BC and BT were also calculated from a high resolution mooring array in Spall et al. (2008).

line 238-239: CHECK!NOT 1 MONTH?

lines 242-245: This justification is not very convincing, I suggest deleting it.

line 340: Magenta does not stand out compared to the colorbar, I suggest using a different color to mark the line.

Mike Spall mspall@whoi.edu

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