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Incorporation of the RAPID 26N and Florida Strait cable observations into the ECCO-GODAE state estimate

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Daily timeseries of the meridional overturning circulation (MOC) estimated from the UK/US RAPID/MOCHA array at 26.5N in the Atlantic and the ECCO-GODAE state estimate show significant correlations for both the MOC and the Ekman transport with their respective counterpart (at the 95 percent confidence interval). However, the time-mean value of the MOC in ECCO-GODAE is several Sverdrups weaker than the RAPID/MOCHA estimate, while the Ekman transport is similar. Here, we test whether the additional incorporation of the temperature/salinity observations from the RAPID/MOCHA mooring array, as well as the cable estimates of volume transport in the Florida Current into ECCO-GODAE change ECCO-GODAE's representation of the MOC in the Atlantic. Initially, we use experimental one year integrations, where the incorporation of the data results in an increased MOC of about 1 Sv for the northward branch of the MOC above 1000 m, and an increased MOC of about 1 Sv for the southward branch of the MOC between about 2000 m and 3000 m, at 26N and adjacent latitudes. The meridional heat transport increases by about 0.05 PW between 26N and about 40N. Subsequently, we investigate how both the RAPID/MOCHA and Florida Current observations affect the full 15 year ECCO-GODAE state estimate.