Measurement uncertainty for AMOC timeseries

Measurement uncertainty for the RAPID AMOC measurements were first mentioned in Cunningham et al. (2007) and have been further discussed in McCarthy et al. (2015). Uncertainties in the geostrophic transport derived from dynamic height arise from the calibration of temperature and salinity measurements and the gridding of sparse moored instruments onto 20 dbar vertical grid. Accuracies from other components such as the Gulf Stream in the Florida Straits and the western boundary wedge transports have been discussed previously by Meinen et al. (2010) and Johns et al. (2008). Measurement accuracies are shown in Table 1 reproduced from McCarthy et al. (2015).

Table 1: Measurement uncertainty estimates for the AMOC estimates and its components derived from the RAPID array.

(Sv)	RMS Error: 10 day values	RMS Error: Annual Values
AMOC	**1.5**	**0.9**
Geostrophic Transports	**0.9**	**0.7**
Accuracy of Temperature and Salinity measurements	0.8	0.6
Gridding error	0.4	0.4
Other components		
Western Boundary Wedge	0.5	0.5
Gulf Stream in Florida Straits	1.1	0.3

The accuracy of the calculation varies when the full array is not operational. We present here an errorbar for the RAPID AMOC estimates (Figure 1). This error estimate is free to download.

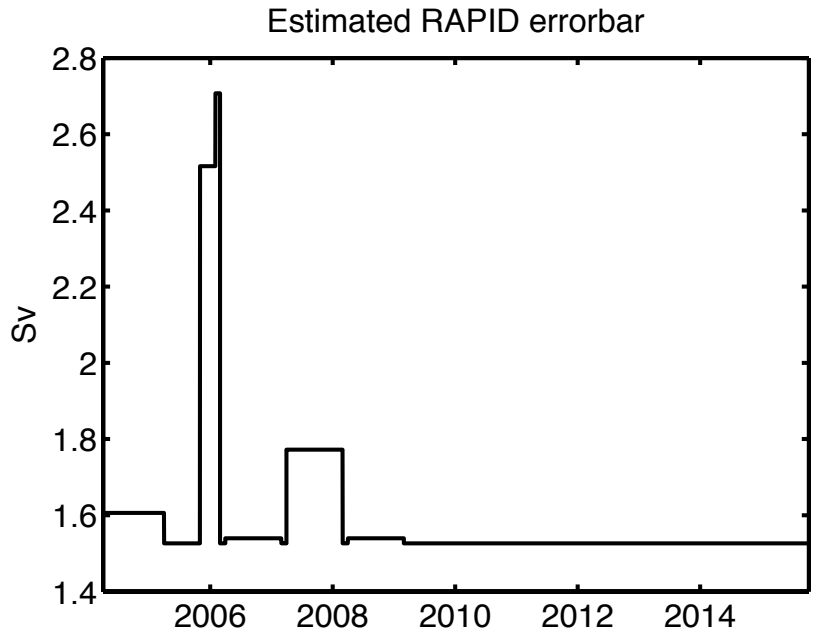

Figure 1: Measurement uncertainty for the AMOC estimates in the RAPID array.

An important element of the nature of the uncertainty estimates is that they do not reduce substantially in annual averages, as described in McCarthy et al. (2015). Here we provide error estimates for the annually averaged AMOC. Annual averages refer to April to April (Table 2).

Table 2: Estimates of annual uncertainty for the AMOC estimates derived from the RAPID array.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Accuracy(Sv)	0.9	1.0	0.9	1.3	0.9	0.9	0.9	0.9	0.9	0.9	0.9

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