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Temporal evolution of CFCs and SF6 signals at 24.5°N during 1998-2016: Transit time distributions, oxygen utilization rates and anthropogenic carbon uptake.

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The A05 repeat hydrography section along ∼24°N in the subtropical North Atlantic is a key region for variations of the Atlantic meridional overturning circulation. Oceanic transient tracers, chlorofluorocarbon (CFCs) and sulfur hexafluoride, were measured along the transatlantic section five times between 1992 to 2016 (SF6, 2010 and 2016 only). The time series are used to document and investigate how ventilation and ocean anthropogenic carbon change over time. The variation of the mean transport timescales from the tracer-inferred transit time distributions (TTDs) are suggesting noticeable different oceanographic conditions for that period, although many decades of tracer signal are integrated. The patterns of changes for TTDs mean ages in the Deep Western Boundary Current is investigated in relation to other properties (apparent oxygen utilisation, temperature, salinity) and the reported variability of the overturning circulation. Finally, we present the apparent oxygen utilization rates and anthropogenic carbon distributions and their inventories overtime estimated from the tracer-tuned TTDs.