



Tracer-derived transit time distributions in the North Atlantic along 36°N and inferred antropogenic carbon concentrations

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We present Transit Time Distributions (TTDs) derived from the transient tracers data set of chlorofluorocarbons (CFC-11, CFC-12) and sulfur hexafluoride (SF_6) measured along 36°N in the North Atlantic during the May-June 2005 Charles Darwin cruise. The CFCs and SF_6 tracers complement each other, since their atmospheric source functions are different. In particular, SF_6 /CFC ratio is a good dating tool of post-1970s water because, unlike the CFC-11/CFC-12 ratio, which has not changed consistently for the last 3 decades, the SF_6 /CFC ratio continues to increase. Using the concept of Transit Time Distributions (TTDs) makes no assumptions about the magnitude of mixing in comparison to the common tracer ages or tracer ratio ages. The TTDs from the surface to the interior are characterized by a mean transit time (Γ) associated with a width (Δ) that implicitly includes the effects of mixing on transport. The derived TTDs are used to estimate the distribution of Anthropogenic Carbon along 36°N and we compare our results to the inventory of Brown et al., who applied the Δ^* and TrOCA method to the same data set.