This is a worthwhile study, and I think it should see the light of day (i.e. be published) after some work on presentation. The authors pursue the potential of synthetic compounds that are regularly measured/monitored in the atmosphere as new tracers for quantifying ocean ventilation timescales. New tracers are needed as the most commonly used tracers, the chlorofluorocarbons, are now decreasing in the atmosphere, and their replacement/complement, Sulfur Hexafluoride, is much more difficult to measure and is likely to suffer from regulatory limits in the near future as well. To evaluate alternate synthetic tracers (almost too many to list), the authors used the analytical equipment built to quantify their atmospheric abundances by adapting/attaching a sparging apparatus to the intake. This allowed the authors to evaluate a number of potential tracers in terms of measurement feasibility, likely stability in seawater, and known solubility.

One issue of presentation has to do with the discussion. HFC-125 is easily quantifiable with the Ampule-Medusa system, and based on one solubility estimate, may be stable in seawater. Rather than discount the tracer (p. 15, lines 35 onward), one would ordinarily recommend that empirical (laboratory) studies of HFC-125 solubility (a la Warner and Weiss, 1998) in seawater be performed. With known solubility, then, HFC-125's stability can be addressed. (The lower mean ages from TTDs are not a hindrance, newer tracers will be expected to yield younger ages). The authors don't discuss anything about possible next steps towards pursuing the promising tracers.

Figure 1 can be improved by dropping 39Ar and $^{14}C$ – allowing the distinction between the anthropogenic gases to be easier to see. Tritium-helium might be a good addition.

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The same perspective could be applied to PFC-14 and PFC-16. Although Agua-Medusa is not sensitive enough for these gases, perhaps they could be pursued with an electron-capture detector? ECDs love C-F bonds, after all. Looking at Table 5, one concludes that PFC-14 and PFC-16 are too hard to measure, but one wonders if that's true using 'traditional' purge-trap GC-ECD techniques.

The discussion would benefit, greatly, with some discussion of what to do next, is what I'm saying. The second author, in particular, is a known leader in developing custom analytical system for aquatic trace trace gases. It is disappointing to have that expertise not weighing in on the potential of PFCs as future tracers. The bottom line is that Agua-Medusa's utility on in oceanography is limited by its poor sensitivity (relative to ECDs). This lower sensitivity requires a water budget (5 liters, by my estimation) that is simply not sustainable on regular oceanographic cruises.

My recommendation is that a few hard passes through the text are required before the paper is ready for publication. The figure and analyses all make sense. The text is confusing and hard to follow, and the conclusions rely too much on "applicability within Agua-Medusa" of these tracers, rather than on the perspective of "applicability within oceanography". I applaud the intent of the effort and am happy to review a draft that is easier to follow.