**Atmospheric
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Comment

Interactive comment on "An integrated flask sample collection system for greenhouse gas measurements" *by* J. Turnbull et al.

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General comments: Flask sample air collection is a well established method to reliably and efficiently collect discrete air samples, for later analysis in a laboratory, for a range of important trace gas species (including specific isotopologues). This has allowed important long term time series for a range of trace gases, particularly those with no available technique to measure in-situ, to be developed at a number of sites around the world. Co-location of flask sample air collection programs with in-situ measurement programs for individual trace gas species (particularly at more remote sites) is very useful for identification of sampling biases or instrumental issues and as a general quality control tool. Due to the relative short sampling time for conventional flask collection

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techniques, the representativeness of these discrete samples for longer periods which are normally used for data interpretation (hourly averaged data) can be limited (less critical for baseline conditions at background oceanic sites). Therefore this development of an integrating flask sample collection system, as described by the authors, is an important advancement in this method and has numerous research applications. The method is well described and in general sufficient detail has been given.

Specific comments 1. p 4085 line 26 - "approximately" or "more than" instead of "∼" 2. p 4087 – heading 2.5 "Remote operation of IC" or similar instead of "...triggering"

Need to be consistent through the paper with: 1. SI units/labels, "liters" versus "l", flow rate units should be "sccm" not "SPLM" I presume. 2. "mole fraction" or "Dry mole fraction" instead of "mixing ratio". 3. when referring to commercial instruments/equipment, state the technique/equipment with manufacturer/make model etc in parenthesis when first mentioned then use technique/equipment thereafter. For example use "CRDS" instead of "Picarro". Specify make/model of all components (flow controllers, pumps etc. P 4081 line 10 – state source of zero air (and specifications available, natural air source?). 4. could introduce a specific definition of the "Integrated flask sample collection system" (sometimes "IC" is used to describe the whole system) before and/or under heading 2 "sampler design and description" (p 4079, line 20) and each of the components of the system. Ensure the diagram (figure 1) is consistent with the terminology. 5. italics for "in-situ".

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 4077, 2012.

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