



## ***Interactive comment on “Development of an autonomous sea ice tethered buoy for the study of ocean-atmosphere-sea ice-snow pack interactions: the O-buoy” by T. N. Knepp et al.***

**Anonymous Referee #1**

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In General, this is a very interesting paper, and one worth publishing in AMT. Several points, however, should be clarified before the manuscript is accepted.

Pg. 2093, lines 4 and 19 (and elsewhere): Give approx metric equivalents for Imperial dimensions

2093, 113: Define MAX-DOAS acronym.

2094-2095: While the description of the ozone calibration procedure is detailed and useful, it is unclear to me whether it is performed once for each experiment or on a periodic basis. The mental picture of the ozone generator sitting near the buoy in a heated tent, and with its own electric generator, seems rather discongruous with the

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idea of an autonomous buoy.

2096, 1-2: Some details on the order of magnitude improvement of precision of the Licor would be useful.

2097-2098, "Standards". I'm confused here. Using 1 liter bottles of standard gas, and flow rates of 100ml/min for 1 min, how is there enough gas for more than 10 calibrations ?

2103-2104: The section on power sources and control is detailed and well written. However, the weakness of the buoy design seems to be that the principal power sources (solar panels + rechargeable lead-acid batteries) are separated from the main buoy. Presumably this is the 'tethered' aspect referred to in the manuscript title. Looking at the photo, I question the viability of this design in a thin ice environment. Does the battery 'platform' float ? It is not clear in the photo. The caption of Fig. 6 indicates that the lead acid packs and solar panels will eventually be integrated into the main buoy. Given the size and weight of lead acid batteries, this will not be a trivial redesign.

2105, 15: In Table 1, I am astonished that fully 61% of the power is used by the PC. There must be more efficient computers available ! A factor of 2 reduction in power would seem to be a priority.

2107, 1-4: Typical that of all the instruments its the anemometer that fails !

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