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## ***Interactive comment on “Winter observations of CO<sub>2</sub> exchange between sea-ice and the atmosphere in a coastal fjord environment” by J. Sievers et al.***

### **Anonymous Referee #2**

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The manuscript by Sievers et al focus on CO<sub>2</sub> exchange between sea-ice and the atmosphere in a coastal fjord environment. This is a relatively unexplored field and the paper can thus be an important addition to the very few data that previously exists. The conditions puts significant problems to the equipment, which adds uncertainties to the results. The discrepancy with chamber data at site POLY1 could very well be explained by shortcomings of the chamber methodology (in particularly when measuring an uptake). I, however, agree with previous comments posted by reviewers that the problems with internal heating of the Li-7500 sensor itself and concurrent possible errors in the estimated fluxes should be further addressed. The described system is supposed to be developed for cold conditions, but the data are taken at quite extreme situations and

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the possibility of the results being partly explained by instrument disturbances should be further discussed in the paper (as well as the possible consequences for the conclusions). In general the quality control of EC data should be done very carefully and the authors should describe the procedures further.

In section 4.2.1 the strong correlation between CO<sub>2</sub> and sensible heat flux is discussed, both CO<sub>2</sub> and sensible heat flux could also be controlled by wind speed, but that common forcing is not discussed in this section as a possible explanation.

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Interactive comment on The Cryosphere Discuss., 9, 45, 2015.

TCD

9, C250–C251, 2015

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