

## ***Interactive comment on “Evaluation of various observing systems for the global monitoring of CO<sub>2</sub> surface fluxes” by K. Hungershoefer et al.***

**Anonymous Referee #1**

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The paper by Hungershoefer et al. discusses the information content of CO<sub>2</sub> observing systems (air sampling or satellite retrievals) for inferring surface CO<sub>2</sub> fluxes, by comparing the achievable posterior errors or error reductions. It extends previous studies of this type, as it is more comprehensive in systematically taking into account a variety of existing or planned satellite missions, and also a hypothetical extension of the land-borne air sampling network. As another extension, target precisions are compared to the actual needs for answering relevant scientific or political questions. This is timely and relevant for the development of the field. The paper is written in a very clear style, and is very honest about its unavoidable limitations. I would highly recommend this paper for publication, and only have a few very minor suggestions as listed below.

p.18565 line 6: add “target precision”

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p.18569 line 3: Not fully clear what “total uncertainty” means in time - does it refer to the yearly flux sum?

p.18570 lines 20-21: formulation a bit misleading, as continuously measuring stations also exist outside Europe and North America

p.18572 line 23: Maybe more clear: “... simplicity, the same weighting function is used for all shots of a given instrument.”

p.18575 lines 20-21: The two sentences appear to contradict each other (maybe use “even though” if that’s what you mean).

p.18579 line 18: you say “probably”, but couldn’t this be easily checked?

Fig 2 caption: which satellite is shown in (d)?

Typos: p.18573 line 26 “become”, p.18586 line 26 “seem”

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 18561, 2010.

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