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Geoscientific Instrumentation Methods and Data Systems
Discussions

Interactive comment on "Designing optimal greenhouse gas observing networks that consider performance and cost" *by* D. D. Lucas et al.

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The paper describes a technique to design a network of greenhouse gas observing stations which tries to be optimal in terms of performance (emission estimation error) and cost.

It is well written, and the technique seems to have been implemented with rigor, and the results and conclusions are correctly argued.

The technique uses Bayesian inversion to estimate emissions and a multi-objective genetic algorithm to find the optimal network, considering the Pareto frontier of performance and cost.

The paper takes simulated data as input, based on a forward transport model with

some added noise. As stated in the paper (section 4.2 and section 6, summary and conclusions) this is more about a proof of concept than a real-world case study. Though the results are plausible, and the proposed technique seems a good candidate to be taken into account in a real-world study, it would be nice if some of the assumptions were discussed more deeply and related to a real world scenario: noise is constant in space and time (section 2.2), same measuring frequency for all the stations (section 4.2.1), the cost function (section 4.2.2), etc. The impact on the results of altering these assumptions could also be more detailed.

Page 713 line 20: 'these values are used estimate' should be 'these values are used to estimate'

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 4, 705, 2014.