

## ***Interactive comment on “Robust extraction of baseline signal of atmospheric trace species using local regression” by A. F. Ruckstuhl et al.***

**Anonymous Referee #1**

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This paper presents a statistical method for determining background mole fractions from a high-frequency trace gas time series. The main focus of the paper is the application of a previously-published method for determining baseline signals (Ruckstuhl, 2001) to atmospheric data. The novel work appears to be in the estimation of a set of parameters that can make this technique applicable to atmospheric baseline estimation. For this reason, the paper does not seem to represent a very large advance on previous efforts. However, given the importance of baseline estimation in atmospheric chemistry, I think the paper could possibly be accepted for publication in AMT, provided that the case can be made that this approach is a significant improvement on previous methods.

My specific concerns are:

- I did not find that the application to CO from the Jungfraujoch alone made the case that the method was 'robust'. The application of the same methodology, using the same parameters, to a range of gases measured at the station would be more persuasive.

- I would like to know how the derived background mole fractions compare to those at a stations where baseline levels can be more easily determined (e.g. Mace Head, Ireland). If the 'regional' (European) signal is indeed being removed from JFJ, then the two baseline signals should be very similar.

- Some previous methods were mentioned (Thonning, 1989; Novelli et al., 2003, O'Doherty et al., 2001), but a comparison was only made to the approach of Novelli et al, (2003). A stronger case could be made by comparing the proposed approach with all the cited methods, and showing that it offers distinct advantages (which should be explicitly stated).

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Interactive comment on Atmos. Meas. Tech. Discuss., 3, 5589, 2010.

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