

## ***Interactive comment on “Tomography-like retrieval of auroral volume emission ratios for the 31 January 2008 Hotel Payload 2 event” by C.-F. Enell et al.***

**C.-F. Enell et al.**

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Received and published: 3 April 2012

*Referee 2: In their manuscript, Enell et al. describe an event study using a tomography-like method for retrieving auroral volume emission ratio. The manuscript is nicely written and organized, although it would benefit of a clearer statement of the actual objective of the case study.*

We agree. The original title was changed as suggested by the editor but a more clarifying title should be chosen.

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*Furthermore, the authors themselves state a "zero result". They do not elaborate the details or highlight observations leading to new hypotheses about the physics or chemistry. In fact, much of the event has already been discussed by Enell et al. (JASTP 2011) given in the references.*

This is correct and we chose not to repeat this discussion. The original purpose was in fact a direct comparison between the rocket-borne and ground-based measurements but viewing geometry did not allow this. Instead, the ground-based measurements over the mainland contradict the subsidence of air observed by the rocket NW of Andøya, but this is in agreement with the large-scale observations by satellites.

*From the instrumentation and methodology point of view, the tomography-like reconstruction has been described in detail by Gustavsson (2000). In my opinion, the method has a lot of potential but, at the same time, introduces questions relevant to experimentalists.*

*What is the effect of absolute calibration? Or, more accurately, how does the output vary as a function of geometric and intensity calibration quality, atmospheric effects (low elevations), flat-field quality and other real practical issues?*

The referee is right that the absolute calibration is an important issue and the authors (Brändström, Gustavsson, Enell and collaborators in Finland and Norway) plan to address this question in much more detail in future publications, both by laboratory calibration of the cameras and by using star spectra.

*What about error estimates? It would be a useful contribution to investigate effects like these in a systematic manner. The manuscript in its present form provides little new knowledge for a more thorough understanding of the tomography-like method. This*

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*knowledge would be of significant importance for end-users that may want to use this potentially very useful tool in their atmospheric studies.*

We will stress that the first author is not an expert on tomography but is mainly interested in remote sensing of middle and upper atmospheric composition. Estimates of the accuracy have been published by Gustavsson.

As we are mainly interested in the relative intensities of the blue and green line emissions, only the relative intensity calibration matters. The retrieved ratios turn out to agree well with theoretical estimates. Although this is in a sense a zero result, it is a confirmation that the retrieval works in the case of a stable auroral arc.

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Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 1, 2012.

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