

## ***Interactive comment on “Ammonia emissions from a grazed field estimated by miniDOAS measurements and inverse dispersion modelling” by Michael Bell et al.***

**Anonymous Referee #1**

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This paper describes path measurements of NH<sub>3</sub> with miniDOAS systems and a method to derive emission factors from the measurements. The measurements and modeling framework are generally well described and presented, although I miss some general information to really understand the pit-falls and potential shortcomings of the bLS method. Most importantly, I think it would be good to present a general “expectation” based on the forward modelling more clearly. Under “normal” neutral stratification of the surface layer emissions are taken up by the atmosphere and vertically (and horizontally) dispersed. Thus, the concentration will generally increase relative to the background (S<sub>2</sub>), and in ideal circumstances with homogeneous emissions, S<sub>3</sub> will generally be higher in concentration than S<sub>1</sub>. Also, the concentration will not increase

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linearly with distance, since vertical dispersion takes place. A clear description of this concept will help the reader to understand the need for non-homogeneous emissions in Period 2.

A second general remark is that the formulas sometimes lack units, which is easy to solve. Further comments are in the annotated pdf document.

A third remark concerns the choice of Period 2 for the Q/EF estimates. This period is characterized by a more uncertain background. The reason given (Period 1 is too short) I find not convincing. More emphasis should be placed on Period 1, which seems more consistent from a methodological point of view.

In general, the paper is carefully prepared and well-written, and I recommend publication after minor revisions (as requested above and in the annotated pdf).

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/amt-2016-350/amt-2016-350-RC1-supplement.pdf>

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-350, 2016.

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