

## Editor Comments to the revised version of amt-2016-382

In the following list, the page (P) and line (L) numbers generally refer to the revised version with track changes. But it has to be noted that the line numbers from page 11 on were somehow confounded and thus I used the true line number per page.

### Scientific Comments

1) In the response to Referee W. Eugster, the authors write that they "were therefore keen to keep a standard dispersion setting as the CFD model was initially evaluated using very similar parameterisation...".

However, on P17, L14-15 it is stated that the turbulence mixing parameters of the model were optimized to match the bag samples of a tracer release experiment at the landfill site. This are two contradicting statements in my view that need explanation. In addition, the optimization of the turbulence parameterization and the performed tracer release experiment need to be described in more detail because they are quite crucial for the presented results.

2) P6, L17-18: Indicate the height of the wind measurements. How accurate was the wind direction obtained with the instrument/setup?

3) P8, L25-28: I do not agree with the conclusion here, that thermal effects can be generally neglected for wind speeds greater than  $2 \text{ m s}^{-1}$ . The two cited literature references do not provide enough arguments for the conclusion. Both references report on studies in winter, when thermal effect (especially unstable situations) do not have the same importance like for the present summer time experiment. Also the urban source distribution and environmental conditions were different from the present study. Moreover, the height of the wind measurement (also in relation to the underlying surface roughness) needs to be taken into account. Therefore the text needs to be rephrased here and the (non-negligible) uncertainty of the CFD model related to unaccounted thermal stability effects should be mentioned (or better arguments need to be provided for the original conclusion).

4) P26, L30-32: It may be useful to mention here, that the use of multiple, spatially distributed sampling points would allow to better identify and distinguish between different source areas, (more accurately than via wind direction variations).

5) P26, last line: Please specify how emissions can be detected by an "initial walk over survey".

### Technical and Language Corrections

- P1, L11: specify: "...corresponding to a spatially integrated emission of  $53.3 \text{ kg h}^{-1}$  ..."

- P5, L1: In the title of Section 2.2 better use "FTIR" instead of "Spectronus". It would be more informative, because "FTIR" is used throughout the text.

- P6, L25: The formulation "...provide space filling results, ..." is unclear. Rephrase this sentence. Lagrangian models also provide a spatially resolved 3D distribution of the concentration plume but usually cannot account for topography effects on the wind field. This should be clarified here.

- P6, L26: The sentence "The CFD simulations presented in this study have been validated previously by ..." is unclear to me. I assume that the CFD model in general has been validated, not the specific CFD simulations in this study. Please specify and rephrase.

- P8, L15: correct to "where C is the concentration of ..."
- P8, L15: "D" should be better specified e.g. as "molecular diffusion coefficient".
- P8, L18: The last sentence of section 2.4.2 should be shortened to "Sc<sub>i</sub> values range between...".
- Figure 3 caption: the expression "...as the gradient from the correlation of ..." is not adequate. Rephrase e.g. to "...as the linear regression slope of  $\chi_{\text{CH}_4}$  vs  $\chi_{\text{CO}_2}$  ..." like in the main text.
- Figure 5a: Indicate, which coordinate system was used on the axes?
- P23, L1: omit "derived"
- P26, L1: correct to "They report an uncertainty of 42% that is similar to our approach."
- P27, L2: rephrase the sentence "The main uncertainty results from the model accuracy."
- P27, L4: The formulation "...from a range in wind direction" is not clear to me. Please rephrase.
- P27, L11: change to "Enhanced  $\Delta\text{CH}_4$  was observed ..."