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Interactive comment on “An ecosystem-scale perspective of the net land methanol flux: synthesis of micrometeorological flux measurements” by G. Wohlfahrt et al.

G. Wohlfahrt et al.

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Anonymous Referee #2 Received and published: 29 March 2015

Review: An ecosystem scale perspective of the net land methanol flux, authors Wohlfahrt, et al.. This study reviews the literature to find independent controlling variables for methanol emission and deposition by examining eddy covariance measurements at various sites. The most important variables for emission are noted to be PAR

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and evapotranspiration, whereby methanol production in leaves is released through stomata. Deposition is more related to relative humidity and surface turbulence, implying that methanol is absorbed onto wet surfaces. These controlling variables have been recognized previously, as is cited. Although it is mentioned, no discussion is included on microbial production or consumption of methanol; the authors' omissions suggest that they consider this insignificant. Some comments on this may be helpful.

Reply: We mention the role of microbes on several occasions in the ACPD paper (p. 2581, l. 22, p. 2586, l. 17, p. 2592, l. 16), in doing so cite several references on this topic and discuss the need to better understand microbial methanol exchange in particular with regard to deposition of methanol during periods of surface wetness.

The discussion rightly indicates that current models, which treat emissions and deposition separately, have difficulty in assimilating eddy covariance data. While the summary of data from various experiments and the determination of the important variables controlling emission and deposition is useful, no attempt is made to outline how this may be accomplished. This is unfortunate, since several of the contributors may be well-placed to offer some ideas. Perhaps this may be included in a revised manuscript.

Reply: As indicated by the reviewer, the existing observations make it clear that we need a modelling approach that integrates both emission and deposition. The field observations described in this study are insufficient for developing this approach. Additional studies of these processes under controlled conditions are required for this (see reply above). The observational database described in this study can then be used to evaluate potential model approaches.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 2577, 2015.

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