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Interactive comment on "CH_4 and N_2O dynamics in the boreal forest–mire ecotone" *by* B. Ťupek et al.

Anonymous Referee #3

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General comments: The manuscript studies the question if CH4 and N2O dynamics in transition zones between boreal forest and peatland are similar or different from those, considering that vegetation and hydrology change spatially and temporally between years. While carbon and nitrogen cycling in both boreal forests and peatlands are well studied, the transition zone has been less investigated. This can be an important factor for up-scaling to regional scales.

The authors report results from static chamber measurements along a 450m transect for the climatically different years 2004, 2005 and 2006. Statistical analyses (ANOVA, Tukey tests) are used to test differences between locations and years. Environmental controls are analyzed by fitting linear regression models to the flux data. Generally, substantial CH4 fluxes only occur in the peatlands, while in forest soil and transition

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zones mostly CH4 oxidation (neg. CH4 fluxes) occurs. N2O emissions are small along the entire transect. The authors conclude that these transition areas are likely no hot spots for CH4 and N2O emissions.

The paper is well written and fits into the scope of 'Biogeosciences'.

Minor comments: It looks like that the three forest-mire transition types (at least KgK and KR) are more similar in their CH4 emissions to the upland forest than to the mires (N2O emissions are similarly low), even though soil organic matter content and soil moisture are higher than in the mineral forest soils. The authors discuss that during the few occasions when the water table rises in the transition zones, a 'slow' response of the microbial communities prevent higher methane fluxes. I suggest to add vegetation characteristics in this discussion: e.g. sedges can both enhance methane production by supplying 'fresh' carbon substrate to methanogens as well as provide transport to the atmosphere via their aerenchyma.

Interactive comment on Biogeosciences Discuss., 11, 8049, 2014.