Atmos. Chem. Phys. Discuss.,
doi:10.5194/acp-2016-110-RC1, 2016

Atmospheric Chemistry and Physics Discussions

Interactive comment on "NO_x emissions, isoprene oxidation pathways, vertical mixing, and implications for surface ozone in the Southeast United States" *by* K. R. Travis et al.

Anonymous Referee #1

Received and published: 12 April 2016

The authors use aircraft, surface, satellite and ozonesonde observations to investigate factors controlling surface ozone concentrations in the Southeast US. This is done by comparison to a state-of-the-art chemical transport model. One of the major findings of the study is a high bias of the EPA National Emission Inventory for NOx, most probably due to an overestimation of industrial and mobile sources. Further results are a deviation between NO2 observations and the NO-NPO2-O2 photochemical steady state in the upper troposphere, the role of the partial separation of isoprene and NOx emissions on isoprene chemistry and the effect of NOx reductions on ozone production efficiency. The data analysis is sound and the paper is well written. Thus this manuscript should be published after some minor revisions.

Actually the only criticism that I have is the statement, that ROx chemistry has only a minor role for the NO/NO2 ratio at high altitudes. I agree, that NO2 photolysis and the NO + O3 reaction might be dominant, but due to the low temperatures the later reaction is slower in the UT. Observations indicate that HOx (and most likely RO2) are often enhanced in the UT due to convective injection of precursors. Thus it would be interesting to quantify the role of HO2 and RO2 for the NO/NO2 ratio in the UT.

A minor point is that the titles of chapter 6 and 7 are identical.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-110, 2016.