

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

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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 NO_x, 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 NO_x emissions on isoprene chemistry and the effect of NO_x 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.

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Actually the only criticism that I have is the statement, that RO_x 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 HO_x (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.

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