

Interactive comment on “OH reactivity at a rural site (Wangdu) in the North China Plain: Contributions from OH reactants and experimental OH budget” by Hendrik Fuchs et al.

Anonymous Referee #4

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Fuchs and colleagues presented a field campaign dataset in Wangdu China and mostly focused on interpreting ambient total OH reactivity dataset using a comprehensive trace gas dataset. They reported some occasional missing OH reactivity but much lower level than previously reported extreme cases. This may be a consistent finding in the anthropogenic dominant environments. Then, the comparisons with previous fieldworks are presented. Finally, the comparison between OH production rates and loss rates are compared and concluded that observationally assessed OH destruction rates are in general higher than the OH production rates. As the authors claimed that interests in megacity air quality especially countries like China have grown but field observational datasets have been very limited. Therefore, the presented dataset and

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analysis will be highly beneficial to the research community. I am in favor of publication of this manuscript with the clarifications of a couple of points raised in the manuscript.

1. 305 – 310: Most of uncertainty analysis that I have encountered uses at least 2 sigma uncertainty rather than 1 sigma. If you use 2 sigmas probably the calculated OH reactivity would be able to account measured OH reactivity. 2. Figure 7 and Figure 8: It has been highly controversial about the nighttime OH. As observed, the lifetime of OH is much shorter during the nighttime so it is rather surprising to see observed nighttime OH such a low OH production during the night. There is an obvious attempt to account the observation such as ozonolysis of terpenoids and dissociation of potential contributions from PANs but could not provide a quantitative assessment since there is no observation data. However, as it is so important issue, I think at least the authors should attempt to assess what kind of PANs or terpenoids levels you would need to account the night time OH. Otherwise, as the discrepancy between OH production rates and OH destruction rates are appeared almost identical except in the early morning, some may conclude that the discrepancy may be simply accounted by an instrument artifacts as described in the manuscript. 3. (minor comment) Recently, Kim et al (2016) reported observed OH reactivity in the Seoul Metropolitan Area. The addition of this reference to the comparison could be useful.

Reference: Kim et al., OH Reactivity in Urban and Suburban regions in Seoul, South Korea-An East Asia megacity in a rapid transition. Faraday Discussions DOI:10.1039/C5FD00230C, DOI:10.1039/C1035FD00230C (2016).

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