

## ***Interactive comment on “Emission inventory of semi-volatile and intermediate volatility organic compounds and theireffectson SOA over the Pearl River Delta region” by Liqing Wu et al.***

**Anonymous Referee #1**

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The authors developed a high resolution emission inventory of semi-volatile and intermediate volatility organic compounds (S/IVOCs) for the Pearl River Delta region, and then evaluated the impacts of anthropogenic S/IVOCs on secondary organic aerosols (SOA) by a regional chemical transport model. The primary emissions and chemical degradation mechanisms of S/IVOCs are among the key knowledge gaps in better understanding and predicting the SOA formation. Thus this study is useful for future modelling studies of SOA in the PRD region. I would recommend that this manuscript can be considered for publication after the following specific comments being addressed.

Introduction: a brief introduction of S/IVOCs at its first appearance should be helpful

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for the readership to better understand the context of this study. For example, what compounds do the S/IVOCs include? What are their major sources? Etc.

Section 2.1: it is not clear if this S/IVOCs emission inventory only include one ‘bulk species’ or include individually many S/IVOC compounds for model use? I also wonder if there are biogenic sources of S/IVOCs. If so, the authors may need elaborate that this study mainly focused on anthropogenic emissions.

Section 3.1: I am curious that dust is a source of S/IVOCs. It would be helpful if the authors elaborate more about this source by several sentences.

P1, L13: change “the Pearl River Delta (PRD)” to “the PRD”, as you have already defined the PRD in Line 12.

P1, L15: emission factors of POA...

P5, L16-17: I suggest the authors to provide a brief description of the definition of parameters used in this Equation (1) here, so that the readers do not need to refer to the supplement.

P9, L13-14: the same as the above comment.

P10, L6: the roles of S/IVOCs in the formation of SOA...

P15, L13: in my opinion, WQS should be a regional receptor site in the PRD region other than a regional background site, as it is generally located at the downwind of city clusters in winter monsoon season.

Table 3: I suggest moving this table to the supplement.

Is this newly developed emission inventory can be used by the modelling community? If so, how can it be accessed? A comment on this should be given in the data availability.