

Interactive comment on “Air quality in the Kathmandu Valley: WRF and WRF-Chem simulations of meteorology and black carbon concentrations” by Andrea Mues et al.

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We thank reviewer #2 for reading our manuscript. We also thank the reviewer for sharing their concerns about the appropriateness of our manuscript, but strongly disagree with the reviewer's point of view that our article is not within the scope of Geoscientific Model Development because it *"is mainly an evaluation exercise"* and *"no model developments are presented"*. One of the six manuscript types listed on the GMD website is "model evaluation papers". Our manuscript has been submitted as such, as can be seen by the "MS Type". Furthermore, we would like to stress that our manuscript is a contribution to the special issue "The community version of the Weather Research and

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Forecasting Model as it is coupled with Chemistry (WRF-Chem)". This special issue "[...] hosts scientific technical documentation and evaluation manuscripts concerned with the community version of WRF-Chem."

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We also disagree with the reviewer's opinion that "[...] *the authors claim that they have introduced relevant improvements to the WRF-Chem model [...]*". In the manuscript we state that (page 3, line 27) "Two modifications have been applied to WRF-Chem compared to the standard model version." regarding emission of sea salt and gravitational settling of aerosol particles. Both modifications are not relevant to simulations of black carbon over Nepal and have been mentioned in the manuscript for completeness. No claims of significant model improvements have been made.

In this study, the WRF-Chem model is used to examine to which extent a widely used state-of-the-art meteorology and air quality model is able to reproduce observations in the Kathmandu region, and provide a preliminary diagnosis (not a full scale investigation) of where there are still gaps in our understanding of emissions and processes. We clearly highlight that there is a significant gap in the emissions, and addressing that gap is beyond scope of the paper. A comprehensive emission inventory for Nepal including previously under-characterized sources is currently being developed and will be used in future publications to understand the role of emissions (or the influences of different emission inventories). We therefore also disagree with the reviewer's opinion that "*The authors should [...] significantly improve the emissions used with WRF-Chem, and extend the meteorological analysis to present contributions that improve the meteorological model.*" as this is not the focus and also not within the scope of a model evaluation study, rather the study provides information to the community about where model deficiencies are found and what developments (e.g., emissions datasets) need to be prioritized.

Interactive comment

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