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Interactive comment on “OMI NO₂ column densities over North American urban cities: the effect of satellite footprint resolution” by H. C. Kim et al.

Anonymous Referee #2

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The study by *Kim et al.* concerns itself with the influence of spatial resolution of measurements of tropospheric NO₂ abundances from satellite. It makes use of a CMAQ simulation of trop. NO₂ columns run at high spatial resolution in order to assess the impact the satellite’s spatial resolution has on the measurements.

While this is an important aspect of satellite measurements of atmospheric composition, I have major concerns regarding the publication of this study in *Geosci. Model Dev.*:

1. I consider this study out-of-scope for the aforementioned journal, as the authors have merely *used* the CMAQ model in their study; the study does not include any

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aspects of model *development*.

2. The study lacks scientific novelty.

Regarding the second point, the fact that measurements of trop. NO₂ over urban areas are not able to capture the high pollution maxima over the emission hot spot due to the spatial smoothing caused by the coarse satellite ground pixel is trivial and has been reported on previously. The fact that the agreement between modelled and measured pixels improves when AK information is applied to the model fields is also trivial; in fact, any quantitative comparison between model and measurements *has to* use AK information, as neglecting to do so leads to a comparison of apples and oranges.

I therefore suggest to *not publish this manuscript in GMD*. The authors should consider re-submitting the manuscript to a journal focusing on the analysis of satellite measurements of atmospheric composition, e.g., to *Atmos. Meas. Tech.* The revised manuscript should not put as much emphasis on the merit of AK information, and should clearly state that the study is about a *quantitative analysis* within a *specific region*, as the general topic has already been discussed previously.

Interactive comment on Geosci. Model Dev. Discuss., 8, 8451, 2015.

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