

Interactive comment on “Inter-comparison of MAX-DOAS measurements of tropospheric HONO slant column densities and vertical profiles during the CINDI-2 Campaign” by Yang Wang et al.

Anonymous Referee #1

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HONO is one of the crucial species that can significantly affect the oxidation ability of low troposphere and further contribute to haze pollution event. Since recent studies indicate that its daytime source is poorly quantified, observations of HONO vertical profiles are meaningful to identify and quantify HONO daytime source. The state-of-art MAX-DOAS technique has been widely applied to observation of NO₂ and SO₂ tropospheric vertical column densities and vertical profiles in the past decade. However, its ability and uncertainties of measuring HONO is not well quantified. Measurement uncertainties of HONO slant column densities were firstly sophisticatedly studied by the first author of this study in 2016 based on real and artificial measurements with several participants during the MAD-CAT campaign. This study further quantified the

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uncertainties of HONO vertical column densities and vertical profiles during CINDI-2 campaign with worldwide participants. The author separately quantified systematic and random uncertainties of HONO profiles caused by HONO dSCD measurements and profile inversion algorithm, and further discussed the effect of a-priori profile, a-priori uncertainty covariance, and input aerosols in the HONO profile retrievals. These studies can urge or promote the development of the MAX-DOAS technique for HONO measurements and its applications in the study of HONO sources and environment pollutions. Overall, this paper is well written and fits well within the scope of AMT. I recommend for publication though I rate the novelty of this paper as moderate. Since referee # 1 has listed numerous technical comments which are mostly overlapped with my comments. Here I don't present the repeated correction request. Extra minor revisions are mainly language or type setting problems (e.g., the references were not presented in a consistent way, such as Atmos. Meas. Tech. or Atmospheric Measurement Techniques, and some are included with DOI, while some do not include) which can be addressed in production stage.

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