

## ***Interactive comment on “The Cabauw Intercomparison campaign for Nitrogen Dioxide measuring Instruments (CINDI): design, execution, and early results” by A. J. M. Piters et al.***

### **Anonymous Referee #1**

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This manuscript provides an overview of what is certainly the most extensive evaluation of NO<sub>2</sub> measurement capability to date. The study brings together in situ measurements with both active and passive remote sensing to assess current capability for characterizing atmospheric NO<sub>2</sub> under a wide range of conditions and to improve the use of such instrumentation to provide ground truth for global satellite observations. By providing an efficient summary of the study details and high-level outcomes, this manuscript provides an effective blueprint for those wishing to investigate the in-depth findings presented in companion papers. Other than some minor comments offered below, this manuscript is ready for publication.

Minor comments:

1. The discussion of the lidar on page 5952 mentions that it has altitude-dependent vertical resolution, but this is confusing until it is made clear in the appendix that the lidar scans several elevation angles. While details of the scanning are appropriate for the appendix, it should be briefly noted at this point in the manuscript that this lidar is pointable and that it provides vertical resolution by scanning a range of elevation angles.

2. In section 4.1, the authors note that to assess accuracy of slant columns, certain algorithmic details were prescribed (wavelength range, cross sections, DOAS settings). This approach makes sense, but was there any attempt to understand what these instruments would have determined left to their own choices? In the absence of any recommended retrieval settings, the instruments will diverge when operating independently, but it is hard to know how large this divergence will be.

3. In section 4.1, it is noted that “all instruments meet the criteria for endorsement by NDACC.” What is the criteria? It should either be defined here or a reference provided.  
On page 5960, line 7: “Tropospheric” is misspelled.

Figure 9 provides a nice qualitative view of how the in situ measurements on the tower behaved at the three altitudes. It would be interesting if you were willing to provide a second panel plotting the time series of the difference in NO<sub>2</sub> between altitudes (3m-100m and 3m-200m).

For figure 12 it would also be interesting to plot the % enhancement seen in the molybdenum instrument compared to the average for the photolytic sensors.

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Interactive comment on Atmos. Meas. Tech. Discuss., 4, 5935, 2011.

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