

# ***Interactive comment on “Estimation of NO<sub>x</sub> and SO<sub>2</sub> Emissions from Sarnia, Ontario using Mobile-MAX-DOAS and a NO<sub>x</sub>-Analyzer” by Zoe Y. W. Davis et al.***

## **Anonymous Referee #2**

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The authors describe a spectroscopic technique (DOAS) for measuring emissions of NO<sub>x</sub> and SO<sub>2</sub> using a mobile monitoring platform. Compared to satellite-based techniques, the method used here has advantages including higher spatial resolution and the possibility of making multiple measurements per day. The mobile DOAS technique is used to measure NO<sub>x</sub> and SO<sub>2</sub> emissions from industrial sources in Sarnia, which is in southwestern Ontario close to the US border. An interesting feature of this work is the use of a NO<sub>x</sub> analyzer which provided measured NO<sub>x</sub>/NO<sub>2</sub> ratios, facilitating the estimation of NO<sub>x</sub> emissions from NO<sub>2</sub> column measurements.

The authors should address the following questions before the manuscript is published

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in ACP.

Line 332: The Leighton ratio is calculated using measured NO and NO<sub>2</sub> concentrations, but the NO<sub>2</sub> measurement is likely to be biased high because of other nitrogen-containing pollutants such as peroxyacetyl nitrate, other organic nitrates, and nitrogen-containing acids that are included in the total NO<sub>x</sub> (and therefore also in the inferred NO<sub>2</sub>) concentration measurements. The authors conclude Leighton ratios provide evidence of peroxy radical-related deviations from the photo-stationary state relationship relating O<sub>3</sub>, NO, and NO<sub>2</sub> concentrations. Uncertainties in the NO<sub>2</sub> measurement (calculated as NO<sub>x</sub>-NO) may also be a factor to consider.

Lines 423 and Line 570: fix "Canada and Canada" reference formatting errors

Line 656: please add a URL for this reference.

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