

## ***Interactive comment on “Characterization of trace gas emissions at an intermediate port” by Aldona Wiacek et al.***

### **Anonymous Referee #2**

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This manuscript introduces a new method for monitoring trace gas emissions in a port area using open path Fourier transport infrared spectrometry over a distance of 455 m. This represents an important development in monitoring of trace gas emissions, although applications in other areas may be limited by the availability of source and detector locations at a suitable distance apart. I recommend that the authors consider the following comments before publication: 1. One significant omission in the measurement capability is SO<sub>2</sub>: estimates of SO<sub>2</sub> emissions are based solely on AIS information. Since SO<sub>2</sub> has been treated by the International Maritime Organisation as the highest priority pollutant gas, this limitation should be stated clearly in the Abstract and the Conclusions. 2. Page 11, lines 6-8: the “arbitrary units” appear to be treated as an absolute measure in assessing the validity of the ozone concentration measure-

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ments. I assume that the units used for IR intensities are not in fact arbitrary, but rather calculated using a fixed procedure. It should be made clear that these numbers are not in fact arbitrary. 3. Page 12, line 22: Am I correct in understanding that the emission rates were calculated for all the gases in Table 3? Please make clear which rates were calculated. 4. The manuscript includes a detailed analysis of emissions in relation to ship movements on 2 separate days (sections 3.2 and 3.3). I consider that one of these analyses is sufficient to demonstrate the capabilities of the method. 5. Page 24, lines 20-26: it is stated that Tufts Cove is the dominant stationary NOX source at around 2000 tonnes per year, yet the provincial total for power generation is 15 636 tonnes per year. Does this mean that there are much larger sources elsewhere in Nova Scotia? The provincial totals seem very high compared to the Halifax emissions given that Halifax accounts for almost half of the population. Please provide some more background to these figures. 6. The manuscript necessarily includes many acronyms. It would help the reader to collect the acronym definitions in a Table. Some minor editorial points: 1. Page 8, line 5 and Table 1: some figures not subscripted 2. Page 9, line 5: "is" not "if" 3. Page 13, lines 27 and 28: the normal convention is to use T for temperatures in kelvin and t for temperatures in degrees Celsius. 4. Figure 6a: do the concentration plots follow the colour scheme red for arrival, blue for departure? Please make clear in the figure legend.

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