Jon-Paul
Mastrogiacomo
University of Toronto
Cameron G. MacDonald, Princeton University
Coleen M. Roehl, California Institute of Technology
Paul O. Wennberg, California Institute of Technology
Debra Wunch, University of Toronto
Poster
Reductions in methane emissions will play an important role in meeting short-term emissions reduction goals, and feature prominently in many municipal government net-zero climate plans. Therefore, we must be able to accurately monitor emissions reductions. However, urban methane emissions are difficult to estimate, and bottom-up inventories often disagree with measurements. The use of enhancement ratios derived from satellite measurements of trace gases is a promising tool for estimating emissions and tracking emission reduction efforts. In this work, we use measurements of methane (CH4), carbon monoxide (CO), and nitrogen dioxide (NO2) from TROPOMI and carbon dioxide (CO2) from OCO-2 and OCO-3 to derive CH4 enhancement ratios. We verify our methodology with measurements from the ground-based TCCON station at Caltech and find promising agreement in the calculated enhancement ratios. We then compare our enhancement ratios measured over cities worldwide to bottom-up inventories and identify discrepancies. Finally, we use our enhancement ratios to calculate urban CH4 emissions and compare to other top-down studies.
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