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Intensive CO2 and CH4 measurement campaign at Mexico-City

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Mexico City (MC) is the home of 21.2M people, 19% of the country's population. The MC urban area has intense emissions of pollutants and greenhouse gases, which accumulate in the overlying air-shed due to the location of the city in a high-altitude basin surrounded by mountains. Local and national authorities have engaged into aggressive emission reduction strategies. The Mexican-French collaborative project, MERCI-CO2, aims to develop atmospheric CO2 measurements that will enable, with the support of atmospheric inversion, to verify the effectiveness of CO2 emission reductions taken by the city authorities. The MERCI-CO2 combines high-precision analysers and low-cost sensors for surface measurements with total column observations up- and down-wind of MC. In addition to the long-term infrastructure currently deployed, an intensive campaign in the spring 2020 will produce an unprecedented data set. For this campaign we will deploy during one month six EM27 spectrometers for total column CO2, CH4 and CO observations; two high-precision analyzer at fixed position and one on board a car for transect measurements; and ten low-cost CO2 sensors which will be setup at air quality stations from the local city network measuring CO, NOx and O3. The dense network will be deployed before, during and after the Eastern vacation period in early April. During this week the traffic, which represents about 70% of CO2 emissions, will be significantly reduced. The atmosphere will be analyzed with a high-resolution transport model to infer the reduction of the surface emissions. This result will be compared to the reduction of the traffic inferred from car counting statistics, and bottom-up estimates. The EM27 instruments will be moved around a large landfill, in order to measure the CH4 enhancement due to this installation, and estimate its emission. The waste sector represent by far the largest CH4 contributor (about 90%) in Mexico, and remains subject to large uncertainties.

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