



## Black carbon network in Mexico. First Results

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After the United Nations Framework Convention on Climate Change celebrated in Paris 2016, many countries should adopt some mechanisms in the next years to contribute to mitigate greenhouse gas emissions and support sustainable development.

Mexico Government has adopted an unconditional international commitment to carry out mitigation actions that would result in the reduction of 51% in black carbon (BC) emissions by year 2030. However, many BC emissions have been calculated by factor emissions. Since optical measurements of environmental BC concentrations can vary according to the different components and their subsequent wavelength measure, it's important to obtain more accurate values.

BC is formally defined as an ideally light-absorbing substance composed by carbon (Bond et al., 2013), and is the second main contributor (behind Carbon Dioxide; CO<sub>2</sub>) to positive radiative forcing (Ramanathan and Carmichael, 2008). Recently, BC has been used as an additional indicator in air quality management in some cities because it is emitted from the incomplete combustion of fossil fuels, biofuel and biomass burning in both anthropogenic and it is always emitted with other particles and gases, such as organic carbon (OC), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>).

Black Carbon, PM<sub>2.5</sub> and pollutant gases were measured from January 2015 to December 2015 at three main cities in Mexico, and two other places to evaluate the BC concentration levels in the country. The urban background sites (Mexico City, Monterrey, Guadalajara, MXC-UB, GDL-UB, MTY-UB), a sub-urban background site (Juriquilla, Queretaro, JUR-SUB) and a regional background site (Altzomoni, ALT-RB).

Results showed the relationship between BC and PM<sub>2.5</sub> in the 3 large cities, with BC/PM<sub>2.5</sub> ratios near 0.14 to 0.09 and a high BC-CO relationship in all the year in Mexico City, who showed that mobile sources are a common, at least in cities with a non-significant biomass burning emission related to agriculture or coal heating. The annual BC concentration media for Mexico City and Monterrey site were near 2.5 μg/m<sup>3</sup>, Guadalajara near 2 μg/m<sup>3</sup>, and Juriquilla 1.2 μg/m<sup>3</sup>. Daily and weekly data showed the BC and CO strong relationships produced by the traffic source in the three main cities. BC can be used as a marker for mobile sources policies in cities to evaluate these results quickly. Guadalajara and Juriquilla had some monitoring issues. Data verification is still being verified.

This work presents a first year BC experimental network extended measure campaign for year 2015 in some cities in Mexico, to obtain direct equivalent black carbon (eBC) concentrations (Also, named when eBC data is derived from optical absorption methods) (Petzold, 2013) using aethalometers and photoacoustic extinction meters. After this effort (mainly from National University and local agencies) it is planned to extend this BC Network to other cities around Mexico and with the Mexican Government support.

### REFERENCES

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