



Impact of external industrial sources on the regional and local air quality of Mexico Megacity

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The air quality of megacities can be influenced by external emissions sources on both regional and global scales. At the same time their outflow emissions can exert an important impact to the surrounding environment. The present study evaluates an SO₂ peak observed on 24 March 2006 at the suburban supersite and ambient air quality monitoring stations located in the northern region of the Mexico City Metropolitan Area (MCMA) during MILAGRO campaign. We found that this peak could be related to an important episodic emission event coming from Tizayuca region, northeast of the MCMA. Back trajectories analyses suggest that the emission event started in the early morning at 04:00 LST and lasted for about 9 hours. The estimated emission rate is high, about 2 kg s⁻¹. This finding suggests the possibility of “overlooked” emission sources in Tizayuca region that could influence the air quality of the MCMA. This further motivated us to study the cement plants, including those in the State of Hidalgo and the State of Mexico. We found that they can also contribute SO₂ in the NE region of the basin, at the suburban supersite and that at some monitoring stations; their contribution can be even higher than from the Tula Industrial Complex (TIC). The contribution of TIC to regional ozone levels is also estimated. The model suggests low contribution to the MCMA and slightly higher contribution at the suburban and rural supersites. However, the contribution could be high in the upper northwest region of the basin and in the southwest and south-southeast regions of the State of Hidalgo. In addition, a first estimate of the potential contribution from flaring activities to regional ozone levels is presented. Results suggest that part of the total regional ozone from TIC-generated precursors could be related to flaring activities.