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## Hit from both sides: tracking industrial and volcanic plumes in Mexico City with surface measurements and OMI SO<sub>2</sub> retrievals during the MI LAGRO field campaign

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**Abstract.** Large sulfur dioxide plumes were measured in the Mexico City Metropolitan Area (MCMA) during the MILAGRO field campaign. This paper seeks to identify the sources of these plumes and the meteorological processes that affect their dispersion in a complex mountain basin. Surface measurements of SO<sub>2</sub> and winds are analysed in combination with radar wind profiler data to identify transport directions. Satellite retrievals of vertical SO<sub>2</sub> columns from the Ozone Monitoring Instrument (OMI) reveal the dispersion from both the Tula industrial complex and the Popocatepetl volcano. Oversampling the OMI swath data to a fine grid (3 by 3 km) and averaging over the field campaign yielded a high resolution image of the average plume transport. Numerical simulations are used to identify possible transport scenarios. The analysis suggests that both Tula and Popocatepetl contribute to SO<sub>2</sub> levels in the MCMA, sometimes on the same day due to strong vertical wind shear. During the field campaign, model estimates suggest that the volcano accounts for about one tenth of the SO<sub>2</sub> in the MCMA, with a roughly equal split for the rest between urban sources and the Tula industrial complex. The evaluation of simulations with known sources and pollutants suggests that the combination of observations and meteorological models will be useful in identifying sources and transport processes of other plumes observed during MILAGRO.

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