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Evaluation of reactive gases simulations using updated emission inventories in the framework of the MACC project

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The goal of this study is to assess the simulations of the distribution of the reactive gases using satellite observations. It will further help to assess the emission inventories used in simulations. This work is the part of the European 7th framework project MACC (Monitoring Atmopsheric Composition and Climate). Within MACC, several anthropogenic emission inventories have been updated, however, we will focus only on CO, NO2, HCHO and SO2 emission distributions. We will evaluate the distribution of these reactive and precursor gases as calculated by three chemistry transport models involved in MACC project i.e. MOZART, TM5 and MOCAGE. These simulation outputs are evaluated by comparing with ground based and satellite observations.
We will present a case study focusing mainly on SO2 emissions from non-ferrous metal smelting industry located in Peru (Ilo and La Oroya smelters) and in Siberia (Norilsk smelter). We will discuss the methodology we have used to improve the emissions from these smelters by using satellite observations of SO2 from SCIAMACHY instrument onboard ENVISAT-1. We will show that a significant improvement has been obtained in the MOZART simulation outputs when the updated SO2 emission fields are used by the model.