



Evaluation of EMEP SO_x emissions with OMI SO₂ retrievals using WRF-CMAQ modeling system for Turkey

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Sulfur dioxide (SO₂) is an atmospheric pollutant and has anthropogenic sources such as coal combustion at power plants and industrial facilities, industrial processes, and high sulfur containing fuel use by locomotives, large ships, and non-road equipment. Satellite retrievals indicated increase in SO_x concentrations in Turkey, especially regions with coal power plants in the recent years. In this study, EMEP SO_x emissions are evaluated for Turkey with OMI SO₂ retrievals. Firstly, the spatial distribution of EMEP SO_x emissions are compared with OMI SO₂ retrievals and high emission regions are determined. A detailed analysis for point source and industrial emissions are performed and whether the effect of residential combustion of coal can be observed is investigated.

Secondly, SO₂ concentrations for one winter and one summer month in 2012 are simulated using a regional air quality modelling system for investigating the effect of different sources such as residential heating and energy production from coal combustion. WRF 3.7.1 is used for simulating the meteorology and CMAQ 5.0.2 is used to obtain atmospheric concentrations over a domain that covers Turkey with a spatial resolution of 10 km. The SO₂ concentrations simulated using CMAQ are compared with OMI SO₂ retrievals. This comparison will determine the similarities and discrepancies in the emission inventories. The comparison of satellite retrievals and with model simulations helps to assess the emission inventory reliability, and decreasing the uncertainty of these inventories.