SCIAMACHY measurements of tropospheric SO_2

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Sulphur dioxide (SO_2) is an important atmospheric pollutant. It is emitted from volcanoes, both during degassing and through eruptions and also from anthropogenic activities such as coal burning, from refineries of oil and gas and nonferrous smelting. In the atmosphere, high concentrations of SO_2 not only adversely affect human health but also contribute to acid rain and the resulting damage to the ecosystem. In addition, SO_2 is closely linked to aerosol formation via sulphuric acid (H_2SO_4) with links to CCN formation, cloud droplet size and feedback mechanisms in climate forcing as well as heterogeneous chemistry.

In this study, SO_2 measurements from the satellite instrument SCIAMACHY (SCanning Imaging Absorption spectroMeter of Atmospheric CHartographY) are presented. The data are analysed for volcanic and anthropogenic emissions, and the spatial, seasonal and inter-annual variability is studied. A special focus is on the evaluation of the potential to use different retrieval windows to obtain vertically resolved information, in particular during volcanic erruptions.