

DOAS: a powerful and versatile tool to probe the atmospheric composition

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Pioneered in the early seventies by Pr. Ulrich Platt and co-workers, the Differential Optical Absorption Spectroscopy (DOAS) has become a powerful and widely used method to probe the chemical composition of the atmosphere. The technique is based on the Beer-Lambert's law which relates the quantity of light absorbed in the atmosphere to the number of molecules in the light path. Since each molecule has its own specific absorption spectrum properties (its "fingerprint"), it allows for highly selective detection of weakly abundant trace gases. Many different light sources and measurement geometries can be exploited so that numerous applications have been developed over the last 20 years addressing a large number of different topics such as the study of stratospheric ozone depletion, the impact of halogens on the tropospheric chemistry, the quantification of emissions from natural and anthropogenic sources or the monitoring of volcanic emissions. In this overview presentation, we introduce the fundamental concepts underlying the method and illustrate some of the most successful applications in the field of atmospheric chemistry studies.