Atmospheric composition is changing, as a result of natural phenomena and anthropogenic activity. Global long term knowledge of the changing atmospheric composition is required to test our understanding of the chemical and dynamical processes, which control the stratosphere and to improve our ability to predict its response to the feedback between climate change and chemistry.

SCIAMACHY, GOME and GOME-2 are passive remote sensing instruments, which address this need by observing back scattered, reflected and transmitted solar radiation from the ultraviolet to the short wave infrared red. GOME has made nadir measurements from the second European Research Satellite since 1995. SCIAMACHY was launched on ENVISAT in 2002 and has now made 9 years of measurements in alternate limb and nadir measurements with solar and lunar measurements being made in the northern and southern hemisphere respectively. In particular the limb measurements of SCIAMACHY yield knowledge about the constituents in the upper troposphere and lower.

Both long lived gases e.g. water vapour, H$_2$O, ozone, O$_3$, and short lived free radicals, e.g. nitrogen dioxide, NO$_2$, and BrO, are retrieved using their characteristic absorptions. The combination of O$_3$, NO$_2$, BrO and H$_2$O gives unique insight in to both dynamical and chemical control of O$_3$. Aerosol, Polar Stratospheric clouds, PSC, and Polar Mesospheric Clouds, PMC are retrieved. In the upper mesosphere and thermosphere, the observations of metals obliterating from meteorites are providing unprecedented and unique information. In this presentation the observations of O$_3$, H$_2$O, BrO and H$_2$O will be a focus and short lived stratospheric species and the observations of metals in the mesosphere and thermosphere will be discussed. In addition results relevant to the mesosphere and thermosphere will be presented.