



## **Development of an Ozone UV DIAL System at the High Altitude Research Station Jungfraujoch**

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An ozone UV Differential Absorption Lidar (DIAL) system is developed and added to the existing multi-wavelength Lidar operated at the High Altitude Research Station Jungfraujoch (HARSJ, 3580 m ASL, 46.55° N, 7.98° E).

The system is based on a quadrupled Nd:YAG laser (Continuum Powerlite 8000) providing the laser emission of 266 nm at a repetition rate of 10 Hz. The initial radiation is focused through a high pressure Nitrogen-Raman cell responsible for the generation of the DIAL wavelengths suitable for ozone detection (284, 304 nm) by the stimulated Raman scattering technique. The 76 cm diameter Cassegrain telescope in the HARSJ's astronomical dome is used as receiver for measurements up to the tropopause. The existing multi-wavelength polychromator fixed at the telescopes rear end is equipped with the additional ozone detection channel.

The performance of the system is illustrated by inter-comparison with an ECC ozone sonde launched by the Swiss Meteorological Institute at Payerne (SMI, 491 m ASL, 46.83°N, 6.96 E). The retrieved data are found to be in good agreement with the balloon sounding and cover an altitude range of 2 to 10 km above the HARSJ.

Since the scientific community disagrees about the real amount of air mass exchange driven by stratosphere troposphere exchange (STE), this new instrument is capable to supply the STE research with remote sensing data from an unique location.