



## **Diode laser based photoacoustic gas detection instruments for environmental monitoring applications**

Z. Bozóki (1), A. Pogány (2), A. Varga (3), Á. Mohácsi (1), and G. Szabó (2)

(1) Research Group on Laser Physics of the Hungarian Academy of Science, University of Szeged, Hungary (zbozoki@physx.u-szeged.hu), (2) Department of Optics and Quantum Electronics, University of Szeged, Hungary, (3) Hilase Ltd., Hungary

We have developed several diode laser based photoacoustic instruments for environmental applications. Both laboratory tests and field measurement campaigns show that these instruments are capable of highly reliable, fully automatic operation over several years, even under harsh conditions. One instrument (WaSul-Hygro) is mounted on-board of a commercial aircraft and measures water vapour and total water concentration in the 1-30,000 ppm concentration range, within the CARIBIC project. Another instrument (WaSul-Flux) measures ammonia concentration in the lower ppb concentration range, simultaneously in up to three channels. Field intercomparison campaigns with several other instruments show that it is a reliable instrument for environmental ammonia monitoring. The third instrument (WaSul-MuWaPas) is a multi-wavelength instrument for quantitative and qualitative aerosol measurements. It measures the optical absorption of aerosols in a particularly broad wavelength range from the UV to the NIR, and consequently it is ideal for differentiation between various aerosol types. The instrument was calibrated with well defined aerosols in the laboratory, and tested under field conditions as well.