

**P-MBU4: Disjunct Eddy Covariant flux measurements with PTR-MS during the BEWA field campaign**

W. Grabmer<sup>1</sup>, M. Graus<sup>1</sup>, A. Wisthaler<sup>1</sup>, A. Hansel<sup>1</sup>, B. Rappenglueck<sup>2</sup>, D. Steigner<sup>2</sup>, R. Zuurbier<sup>2</sup>, R. Steinbrecher<sup>2</sup>

<sup>1</sup> Institut für Ionenphysik, Leopold Franzens Universität Innsbruck, 6020 Innsbruck, Austria

<sup>2</sup> Institut für Meteorologie und Klimaforschung, Atmosphärische Umweltforschung, Forschungszentrum Karlsruhe, Garmisch-Partenkirchen, Germany

A disjunct eddy covariance (DEC) measurement system, which determines the fluxes of biogenic volatile organic compounds (BVOCs) out of vegetation, has been tested in the field. In disjunct sampling, short separate samples are taken instead of continuously sampling the air as in traditional relaxed eddy accumulation (REA) and true eddy covariance systems. This method reduces the number of samples but allows more time to analyse them in order to gain higher measurement precision and accuracy. The disjunct eddy covariance system combined with PTR-MS analysis (proton transfer reaction mass spectrometry) was successfully deployed to measure monoterpene fluxes during the BEWA field campaign 2002 at the Waldstein tower in the Bavarian Fichtelgebirge. The ability of the system to measure monoterpene fluxes above a Norway Spruce (*Picea abies*) forest was demonstrated by comparing successfully flux results obtained with the REA and enclosure approach at the same location.

**P-MBU5: PTR-MS as a Technique for Investigating Stress Induced Emission of Biogenic VOCs**

J. Beauchamp<sup>1</sup>, A. Hansel<sup>1</sup>, E. Kleist<sup>2</sup>, M. Miebach<sup>2</sup>, U. Weller<sup>2</sup>, A. Wisthaler<sup>1</sup>, J. Wildt<sup>2</sup>

<sup>1</sup> Institut für Ionenphysik, Leopold Franzens Universität Innsbruck, 6020 Innsbruck, Austria

<sup>2</sup> Institut für Phytosphäre (ICG-III), Forschungszentrum Jülich, 52425 Jülich, Germany

Proton-transfer-reaction mass spectrometry (PTR-MS) was used in conjunction with two GC-MS systems to investigate stress induced emissions of volatile organic compounds (VOCs) from plants. Experiments were performed in the laboratory under well defined conditions and VOC emissions were induced by ozone exposure at variable concentrations and for different durations. Tobacco (*Nicotiana tabacum* cv. Bel W3) plants were used as the investigated species.

This investigation demonstrated the ability of PTR-MS to provide excellent high time-resolution on-line measurements of the relevant species. The combination of the PTR-MS instrument with the two GC-MS systems (which enabled accurate compound identification) allowed for detailed investigation of the dynamics of the plants' responses to ozone stress. VOCs measured included methanol, C6- alcohols and aldehydes, methyl salicylate and sesquiterpenes. Results indicate that the temporal stress response of plants depend on the amount of stress encountered by the plant. Measurement technique and experimental results will be presented.