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## **Innovative IONICON PTR-ToF-MS technology deployed on NASA atmospheric research aircraft**

*Researchers on a mission for NASA use newly developed real-time trace gas analyzer from IONICON to measure air pollution in the atmosphere.*

**What is the quality of the air we breathe? NASA is trying to answer this question using satellite-based Earth observations. By the end of the century, satellite data shall be used for monitoring and predicting air quality, much the same as now for weather forecasting. To understand how air pollutants are distributed within the Earth's atmosphere, NASA makes use of a new high-tech instrument, a proton transfer reaction time-of-flight mass spectrometer (PTR-ToF-MS), developed by IONICON to measure smallest concentrations of volatile organic compounds in the atmosphere.**

The innovative instrument made by the Austrian high-tech company IONICON Analytik GmbH detects organic trace gases in the atmosphere in split-seconds of measurement time. Analysis with a new time-of-flight mass analyzer combines measurement speed, sensitivity and selectivity in an unprecedented manner. The instrument was deployed for the first time onboard the NASA P-3B research aircraft during the DISCOVER-AQ mission in January and February 2013 to study air pollution in the San Joaquin Valley in California.

"We need to understand how pollutants are vertically distributed in the atmosphere because satellite sensors have a hard time distinguishing air pollution that is close to the ground from the one that is higher aloft. In this effort, NASA has put some of the most sophisticated air pollution monitors on two of its research aircraft. The cooperation with IONICON has put us at the forefront of research" says Dr. Armin Wisthaler who leads the instrument development project at the University of Innsbruck. His team is the only European group among 75 researchers that participated in the recent DISCOVER-AQ campaign. The PTR-ToF-MS analyzer was specially developed by IONICON for this NASA deployment and delivered data with unprecedented spatial and temporal resolution.

IONICON CEO Lukas MÄRK is enthusiastic: "We have been working intensively for years with researchers from all over the world to constantly improve our innovative products. The current collaboration is a perfect example of an ideal synergy between university and industry."

The development of the new high-tech instrument "made-in-Austria" was supported by the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT) within the Austrian Space Application Programme (ASAP 8).

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**About IONICON:**

IONICON is the world's leading producer of VOC detectors with market-leading, on-line and real-time, single-digit pptv-level detection limits using the unique [Proton Transfer Reaction – Mass Spectrometry \(PTR-MS\)](#) and [Selective Reagent Ionization – Mass Spectrometry \(SRI-MS\)](#) technology. Since 1998 IONICON has provided leading scientists with extremely reliable VOC monitoring and quantification instruments in many different [areas of application](#) including environmental research, pollution monitoring, atmospheric chemistry, food & flavour science and illicit substance detection.

The [IONICON product portfolio](#) comprises the PTR-QMS Series: the IONICON High-Sensitivity PTR-QMS 500 with its market-leading detection limit of < 1 pptv; the IONICON PTR-QMS 300 - a very robust and small VOC monitoring system at an affordable price; and the PTR-TOFMS Series (IONICON PTR-TOF 8000 providing a mass resolution of up to 8000 m/ $\Delta$ m and the IONICON PTR-TOF 2000 with its detection limit < 5 pptv).

IONICON sold more than 200 instruments since 1998 and is celebrating "15 Years PTR-MS Community" in 2013.

IONICON also produces special monitoring solutions for various industrial applications, has a strong in-house R&D department and is a partner in many international research projects with renowned academic and leading industrial partners.

**Contact the scientists team from the University of Innsbruck:**

**Dr. Armin Wisthaler**

Institut für Ionenphysik und Angewandte Physik

Web: <http://discover-aq.larc.nasa.gov/>

Web: <http://www.uibk.ac.at/ionen-angewandte-physik/atmoschem/>

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