



New from 2B Tech

Introducing the Model 211-G for FEM Ozone Monitoring

Virtually free of interferences; plug-and-play

The newest member of our product lineup, the [Model 211-G Ozone Monitor](#), uses the proven ultraviolet (UV) absorption method in combination with our patent-pending heated graphite scrubber technology to measure ozone virtually free of interferences. The instrument is ideally suited for measurements of ozone in heavily polluted air where interferences are likely from particulates, mercury, and/or VOCs. The Model 211-G Ozone Monitor has been designated by the EPA as a Federal Equivalent Method (FEM) as a modification to our Model 211 Scrubberless Ozone Monitor: [EQOA-0514-215](#). It offers a precision of 0.5 ppb for 10-s averaging, a linear dynamic range of 0-2,000 ppb, SD data logging, and other features. The long-life heated graphite scrubber of the new Model 211-G eliminates the need for the nitrous oxide source required by our Model 211 Scrubberless Ozone Monitor, and allows the Model 211-G to be a "plug and play" instrument for a variety of applications. Please read our recently published paper for additional information about our innovative [heated graphite scrubber](#).



[Request a Quote](#)

[More Info About the Model 211-G](#)

Air Pollution News

Consumer Products Overtaking Cars as Dominant Urban Air Pollution Source

VOCs from household and industrial products escape freely to the air



Fossil fuels cause air pollution as they're burned in cars and other vehicles, right? Yes, but... it turns out that's now only half the story of how fossil fuels contribute to urban air pollution. Owing to highly successful measures to reduce vehicle emissions, other fossil fuel sources are rising in relative importance.

A recent paper in *Science* finds that household and industrial products, such as paints and cleaners, are now a significant source of the volatile organic compounds (VOCs) that feed into the chemistry that

makes ozone and particulate pollution. By the nature of their uses, these products are usually freely emitted to the air. The authors find that these products - which include pesticides, coatings, printing inks, adhesives, cleaning agents, and personal care products - now contribute half of fossil fuel VOCs in industrialized cities. Especially in the case of particulate pollution, that translates into a bigger role for these products in determining the air quality in major cities.

It seems it's time to add VCPs (volatile chemical products) to the acronym lexicon.

"[Volatile chemical products emerging as largest petrochemical source of urban organic emissions](#)," B.C. McDonald et al., *Science*, 359 (6377), 760-764, 2018.

[Link to Science Paper](#)

Innovation Spotlight

Coming Soon: 2B Tech's Versatile New Calibration Source for Ozone and NO₂ and NO



[The new Model 714 NO/NO₂/O₃ Calibrator coming soon from 2B Tech.](#)
[Now accepting pre-orders.](#)

We all know that $306 + 408 = 714$. But at 2B Tech, it's much more than arithmetic.

It's about how we've combined the capabilities of our Model 306 Ozone Calibration Source and our Model 408 Nitric Oxide Calibration Source to provide a highly portable transfer standard for three pollutant gases-- without the need for a compressed cylinder of nitric oxide. The Model 714 NO/NO₂/O₃ Calibrator, currently undergoing field evaluations, produces calibrated concentrations of O₃ by photolysis of oxygen in scrubbed

ambient air, and calibrated concentrations of NO by photolysis of nitrous oxide via a patent-pending process. Calibrated concentrations of NO₂ are produced by gas-phase titration of NO with O₃.

The concentrations of all three pollutant gases are directly traceable to the NIST photometric standard for ozone - eliminating uncertainties associated with the stability of nitric oxide standards. The instrument has an intuitive touch screen user interface.

Read [more about the Model 714 here](#), and look for it to be on the market later this year!

Pre-order yours today! Email us at sales@twobtech.com to pre-order.

[More Info About the Model 714](#)

Case Study

Diné College Students ASCEND! to New Heights

2B Tech's POM (Personal Ozone Monitor) on Balloon Payload

Editor's Note: We thank Professor Francis Burns for providing this story (formerly with Diné College, now with University of South Carolina).

During spring 2017, a group of Diné College students participated in ASCEND! (Aerospace STEM Challenges to Educate New Discoverers), a program supported by the Arizona Space Grant Consortium. Each student group measured a different analyte as a function of altitude: carbon dioxide (global warming), sulfur oxides (acid rain), radiation, and ozone (ozone layer). These substances affect the lives of the Diné people. The college students combined modern science with the traditional Diné (Navajo) perspective. As one group of students wrote:

"From a Navajo perspective, we consider the Air as a Gift of Life. It was the first thing we took as we entered this world and it will be the last thing we take as we leave this world. We believe the Air we breathe is sacred and must be treated with respect as we perform experiments within the atmosphere."

The Diné (Navajo) students designed and built small payloads for a high-altitude weather balloon. Students used a variety of commercial and "homemade" sensors for their payloads. The ozone instrument was designed and built by 2B Technologies: the Personal Ozone Monitor (POM). The company outfitted the instrument to be used under high-altitude conditions.

During the design and launch phases, Arizona Near Space Research (ANSR) provided Diné College with critical mission support. In early April 2017, ANSR launched the Diné College balloon. It flew to a height of almost 96,000 feet before returning to the ground (Figure 1). After retrieving their data, students worked hard to prepare their oral presentations, which were given at the 2017 Arizona/NASA Undergraduate Research Internship Program Symposium. AZ Space Grant Consortium continues to support Diné College students, who are actively designing balloon payloads. Chemical instrumentation, include the POM, will be sent back into the near-space region above the Navajo Nation. Individuals interested in seeing more images and video about the students' work may go to ANSR's website: <http://www.ansr.org/>



Figure 1: Top: Students prepare for the launch of several payloads, including 2B Tech's Personal Ozone Monitor. Middle: Some of the payloads in flight. Bottom: The balloon had a "birds-eye" view of the earth just before it burst and floated back down to earth. Image source: ANSR.

See Us at These Upcoming Conferences

We'll be at several conferences in the near future -- please be sure to stop by our exhibit booth! See schedule at right for our upcoming conferences.

Conference Name	Conference Dates	Conference Location
2018 Region 4 Air Monitoring Workshop	April 17-18, 2018	Athens, GA
Green Schools Conference and Expo	May 3-4, 2018	Denver, CO
Indoor Air 2018	July 22-27, 2018	Philadelphia, PA

Employee Spotlight: Andrew Turnipseed

2B Tech Research Scientist

2B Tech prides itself on the innovative, sound science behind each of its instruments. Research Scientist Andrew Turnipseed is a key member of the team who makes that possible. He plays a leading role in the research and design behind our instruments, and is on the front lines of the rigorous testing and analysis of their performance. He has authored or coauthored several of the peer-reviewed journal papers that have come out of our work.

Andrew joined 2B Tech in 2014 after 23 years in the atmospheric research community at the National Oceanic and Atmospheric Administration (NOAA), the University of Colorado, and the National Center for Atmospheric Research (NCAR). His expertise covers a wide range, including gas-phase kinetics, ambient trace-gas measurements, and ecosystem-level flux determinations. His work has taken him all around the globe, from the Arctic to the Amazon to Australia and more. Andrew did his undergraduate work at Wake Forest University and graduate work at CU Boulder, earning his Ph.D. in 1990. He lives with his wife and two sons in the Denver area, and enjoys skiing, hiking, biking, and traveling-- any excuse to enjoy the outdoors!



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