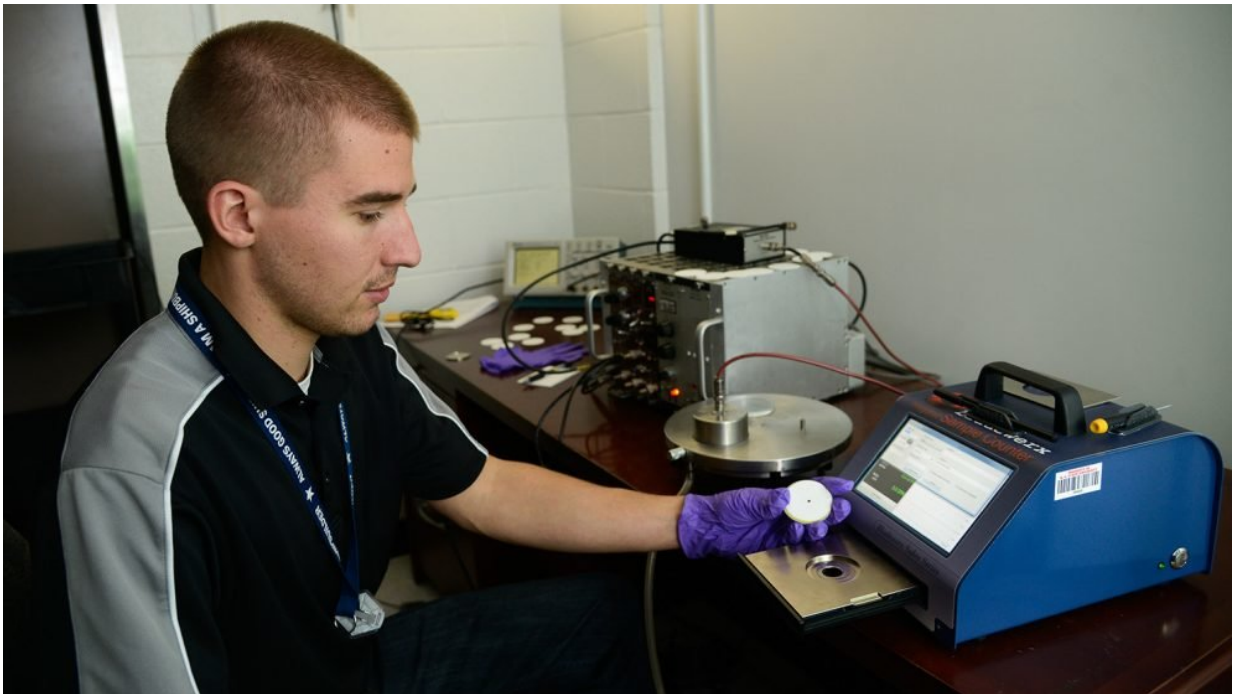


New approach can help authorities respond more quickly to airborne radiological threats

February 7 2018, by Matt Shipman



Credit: North Carolina State University

Researchers from North Carolina State University have developed a new technique that uses existing technologies to detect potential airborne radiological materials in hours instead of days.

"We wanted a rapid way of detecting radiological aerosols that are usually associated with the production of dirty bombs or other

radiological weapons," says Joseph Cope, a Ph.D. student and fellow with the Consortium for Nonproliferation Enabling Capabilities (CNEC) at NC State and lead author of a paper on the work.

At present, emergency responders who are characterizing potential radiological risk need to take an air sample and ship it to a radiochemistry lab after preliminary screening analysis. The process means it can take days or weeks to get quality results that authorities can use to make informed decisions.

"We've found a way that repurposes existing tools, and can give first responders quality information in as little as two hours," Cope says.

"The more time you have, the more precise the data becomes—but our approach allows the authorities to make decisions about evacuating the area, etc., based on defensible information," says Robert Hayes, an associate professor of nuclear engineering at NC State and co-author of the paper.

The new approach involves using a radiation detector to take multiple periodic measurements of an air sample for at least two hours. The measurements are then run through a computer model that uses the data to estimate the potential worst case scenario regarding "transuranic" [activity](#) in the area.

Transuranic elements have an atomic number at least as high as uranium. In general, these are elements that can be used to create radiological weapons.

"Providing the authorities with a conservative estimation method of transuranic activity allows them to make informed decisions, based on robust data and analysis, as soon as possible," Cope says.

"This approach provides additional rapid characterization capability for [emergency responders](#) to radiological events, enabling further optimization of limited resources," Hayes says.

The paper, "Preliminary Work Toward a Transuranic Activity Estimation Method for Rapid Discrimination of Anthropogenic from Transuranic Activity in Alpha Air Samples," is published in *Health Physics Journal*.

More information: S. Joseph Cope et al, Preliminary Work Toward a Transuranic Activity Estimation Method for Rapid Discrimination of Anthropogenic from Transuranic Activity in Alpha Air Samples, *Health Physics* (2017). [DOI: 10.1097/HP.0000000000000735](https://doi.org/10.1097/HP.0000000000000735)

Provided by North Carolina State University

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