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## **Optimization of a Negative Ion Source for Accelerator Mass Spectrometry using Lorentz 2E**

*Wednesday 22 September 2021 10:00 (20 minutes)*

Accelerator mass spectrometry (AMS) is a highly sensitive technique used for the analysis of long-lived radioisotopes. Such measurements are useful in geology, archeology, environmental tracer studies, nuclear waste monitoring, and nuclear forensics. The cesium-sputter negative-ion source acts as a sample injector and, in the cases of carbon-14, aluminum-26, and iodine-129, an isobar suppressor. Integrated Engineering Software's Lorentz 2E ion optics software has been used to model the electrostatics within the ion sources at the A. E. Lalonde AMS laboratory. These simulations include and demonstrate the importance of space-charge effects from the positive cesium ion sputtering beam on the negative ion sample beam. This presentation will illustrate the use of Lorentz 2E to optimize the emittance of the outgoing negative ion beam, while simultaneously maintaining the focusing of the cesium ions on the sample material. These results will be compared with experimental observations.

### **E-mail for contact person**

cties042@uottawa.ca

### **Funding Information**

**Primary authors:** TIESEN, Collin (Andre E. Lalonde Accelerator Mass Spectrometry Lab); KIESER, William (University of Ottawa); Dr ZHAO, Xiaolei (University of Ottawa)

**Presenter:** TIESEN, Collin (Andre E. Lalonde Accelerator Mass Spectrometry Lab)

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