

**ThuPS10**

**Ion Beam Production with Sub-milligram Samples of Material from an ECR Source for AMS**

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Current Accelerator Mass Spectroscopy (AMS) experiments at the ATLAS facility at Argonne National Laboratory push us to improve the ion source performance with a large number of samples and a need to minimize cross contamination. These experiments can require the creation of ion beams from as little as a few micrograms of material. These low concentration samples push the limit of our current efficiency and stability capabilities of the Electron Cyclotron Resonance Ion Source. A combination of laser ablation and sputtering techniques coupled with a new multi-sample changer have been used to meet this demand. We will discuss performance, stability, and consumption rates as well as planned improvements.

This work was supported by the U.S. Department of Energy, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357. This research used resources of ANL's ATLAS facility, which is a DOE Office of Science User Facility