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Contribution ID: **285** Contribution code: **NUF-1**   Type: **Oral Presentation**

The new 3.0 MV Universal Accelerator Mass Spectrometer GANA at Guangxi Normal University

Thursday, 24 October 2024 11:40 (20 minutes)

GANA (Guangxi Accelerator for Nuclear Analysis) is a new 3.0 MV universal Accelerator Mass Spectrometer (AMS) at Guangxi Normal University (GNU), and it supports the analysis of elements ranging from 10Be to 244Pu at 3 MV terminal voltage. Manufactured by High Voltage Engineering Europa B.V., the Netherlands, GANA is equipped with a 50-sample ion source, a high-resolution 120-degree injection magnet, a 90-degree high-energy analysis magnet (mass-energy product 185 MeV-AMU, supports 244Pu+5 at 18MeV), a 65-degree, 1.7 m radius electric analyzer, and a 4 channel gas ionization detector. The 3.0 MV Tandetron accelerator features a high-voltage terminal that supports both gas and foil stripping, with Argon or Helium as selectable stripper gases. To minimize the pressure in the acceleration tubes, the terminal uses a differential pumping system with two turbomolecular pumps. Post-acceleration, a pump restriction minimizes the flow of stripper gas into the high-energy side analyzing beamlines, maintaining a pressure of low 10-8 mbar. This low pressure is crucial for minimizing low-angle scattering on gas particles, thereby achieving high abundance sensitivity for actinides. The rare ions of interest are identified in a multi-anode gas ionization chamber, whereas the stable ones are measured as current in offset Faraday cups with an internal slit system for stabilizing the terminal voltage. A switching magnet in the high-energy beamlines allows using a separate beamline for ion beam analysis.

In this presentation, we will discuss the specifications of the new AMS equipment and report on the acceptance test results for 10Be, 14C, 26Al, 129I, and actinide analyses.

Student Submission

No

Primary authors: Prof. SHEN, Hongtao (Guangxi Normal University); CHEN, Dingxiong (College of Physics and Technology, Guangxi Normal University, Guilin, Guangxi 541004, China); KLEIN, Matthias; SCOGNAMIGLIO, Grazia; MOUS, Dirk (High Voltage Engineering Europa B.V.); Mr FOUCHÉ, Phillip (High Voltage Engineering Europa B.V.); HAN, Xinyi (College of Physics and Technology, Guangxi Normal University, Guilin, Guangxi 541004, China); OUYANG, He (College of Physics and Technology, Guangxi Normal University, Guilin, Guangxi 541004, China); WU, Kaiyong (College of Physics and Technology, Guangxi Normal University, Guilin, Guangxi 541004, China); HUANG, Xinya (Guangxi Normal University); CHEN, Weixin (Guangxi Normal University); DU, Lingrong (GUANG XI NORMAL UNIVERSITY)

Presenter: Prof. SHEN, Hongtao (Guangxi Normal University)

Session Classification: New and Updated Facilities

Track Classification: New and Upgraded Facilities