

Measurement of Pu and U isotopes on the 1 MV AMS system at the Centro Nacional de Aceleradores**Chamizo E**¹, García-León M², García-Tenorio R¹, Hotchkis M³¹ Centro Nacional de Aceleradores (CNA), Avda. Thomas Alva Edison 7, Isla de la Cartuja, 41092 Seville, Spain,² Dpto. de Física Atómica Molecular y Nuclear, Universidad de Sevilla, P.O. Box 1065, 41080 Seville, Spain,³ Australian Nuclear Science and Technology Organisation, Locked Bag 2001, Kirrawee DC, NSW 2232, Australia

In the last decade, compact AMS systems have demonstrated their potential to measure actinides (^{236}U , $^{239,240,244}\text{Pu}$, ^{237}Np). With an appropriate detection system, kinematic filters with enough mass resolution, and a simple chemical procedure, the determination of plutonium isotopes and ^{237}Np at environmental levels is currently possible with this new generation of facilities with even better performance than with conventional AMS systems. However, the measurement of ^{236}U ($T_{1/2}=23.4$ My), produced by neutron capture on ^{235}U , is still a challenge, due to the interference caused by ^{235}U and ^{238}U . In this work, we will explore the possibilities that the 1 MV AMS system at the CNA offers for the measurement of uranium isotopes at environmental levels, in terms of detection limit, efficiency, and precision. Considering the very promising $^{239}\text{Pu}/^{238}\text{U}$ mass suppression factor achieved with our system, of about 10^{-9} , a limiting $^{236}\text{U}/^{238}\text{U}$ atomic ratio of about 10^{-11} was expected, approaching the levels expected in natural uranium. However, to date, only the 10^{-9} level has been obtained, possibly due to the lack of an appropriate uranium material. Currently, different natural uranium materials are being studied, in order to elucidate the origin of the interference. On the other hand, we will discuss the status of the plutonium measurements at our facility, based on the experience we have accumulated in recent years from the analysis of different matrixes over a wide range of plutonium concentrations.