

## Measuring the Good, the Volatile, and the Heavy at DREAMS

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The DREAMS (DREsden Accelerator Mass Spectrometry) facility [1] is designed for routine measurements of the radionuclides <sup>10</sup>Be, <sup>26</sup>Al, <sup>36</sup>Cl, <sup>41</sup>Ca and <sup>129</sup>I. By upgrading the facility the measurement conditions for volatile elements could be improved, e.g. minimisation of the ion source memory effect. Additionally the detection of heavy nuclides has been achieved.

For the measurement of volatile elements e.g. Cl and I, a low-memory-effect ion source, based on the original High Voltage Engineering design was developed and successfully compared to other up-to-date ion sources [2]. Recently, first analyses of unknown <sup>36</sup>Cl-AMS samples were performed with this modified ion source. Parameters like current output, ion source fractionation effects, normalization factors, blank values and sulphur suppression factors have been investigated to enhance the accuracy of <sup>36</sup>Cl data. Applications cover a wide spectrum from groundwater dating [3] and the characterisation of water/rock interactions including brine admixture [4] in arid regions, respectively the investigation of the constancy of the galactic cosmic radiation [5] and the reconstruction of exposure histories of individual meteorites. This broad range of applications also implies highly variable <sup>36</sup>Cl/<sup>35+37</sup>Cl-ratios ranging from nearly background level of  $\sim 10^{-15}$  up to  $10^{-10}$ .

To extend the measurement capabilities to actinides a time-of-flight system based on thin carbon foils and Micro Channel Plates was designed and is under construction at DREAMS. Special beam diagnostic elements were manufactured for an optimal tuning of the system with low currents. In cooperation with the Australian National University first actinide samples were measured at DREAMS.

[1] Akhmadaliev et al., *Nucl. Instr. Meth. B* 294 (2013) 5.

[2] Pavetich et al., *Nucl. Instr. Meth. B* 329 (2014) 22.

[3] Müller et al., *Hydrogeology J.*, in preparation.

[4] Siebert et al., *Sci. Total Environ.*, in preparation.

[5] Smith et al., *AMS-13 abstract*