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## Improved cosmogenic Ne measurements using ThermoFisher ARGUS VI

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Cosmogenic Ne is used to record timing and rates of surface processes on the Earth and Moon and the time of meteorite release from parent bodies. Precise determination of neon isotopes in rocks and minerals has improved in the last ten years largely as a consequence of developments in mass spectrometry and associated electronics. In this presentation we will report the performance of an ARGUS VI mass spectrometer tuned for cosmogenic Ne determinations from both extra-terrestrial and terrestrial material. The instrument is connected to an automated laser gas extraction and purification system and has several advantages over off-the-shelf instrumentation. The remote operation of sample heating, gas purification, separation and isotope analysis increases sample throughput, and the exact repetition of the procedures and overnight determination of calibrations and blank measurements improves data quality, facilitates determination of isobaric interferences and eases trouble shooting. The low static volume results in high sensitivity, while the stable electronics and multi-collection allows high precision Ne isotope determinations in terrestrial and extra-terrestrial samples that are significantly smaller than typically analysed to date.

Two analytical protocols are applied depending on sample Ne concentration. Multi-collection Faraday mode is used for extra-terrestrial material. This yields a 4-fold improvement in the overall uncertainty of the Ne isotope ratios (0.5%) compared to that obtained using 5-10x larger samples in peak-jumping mode on our workhorse instrument. Cosmogenic Ne determinations in 20-30 mg of terrestrial material are made using the compact discrete dynode detector in peak-jumping. Replicate analysis of CREU-1 quartz yields reproducibility of  $\pm 3.7\%$  ( $1\sigma$ ), comparable to the data quality for 5-10x more material. In addition to instrument performance characterisation, we will summarise data from studies of terrestrial and extra-terrestrial material that demonstrate routine capability.