## Contribution submission to the conference SAMOP 2023

**Implementation of an EA-IRMS-GIS system to CologneAMS**

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As part of the CRC1211 project -Evolution at the dry limit- dating analysis is asked for soil samples from the Atacama desert, resulting in ultra-small samples with a carbon content of about 2-20$\mu$g. The ultra-small-scale AMS $^{14}$C analysis will be used for the determination of ages of organic compounds isolated from the desert soils.

For this reason a new elemental analyser (EA) and an isotope ratio mass spectrometer (IRMS) have been coupled to the 6MV AMS system of CologneAMS. By only measuring one sample this will provide a fully automated, online-analysis of $^{14}$C/$^{12}$C, and it will deliver precise values for $\delta^{13}$C and $\delta^{15}$N.

The EA-IRMS has been set up with a direct connection to the existing gas interface (GIS) and has been implemented into the software which is controlling the measurements. In this way it is possible to measure quasi-simultaneously the $^{14}$C concentration with the 6MV AMS system and the $\delta^{13}$C value with the IRMS device.

We will investigate whether this new set-up will enable improved fractionation correction which are used in the $^{14}$C data evaluation. $\delta^{13}$C values will be used for correction of fractionation in the AMS system, to increase the measurement accuracy and finally, to solve dating problems in different archives of the desert.

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