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New extraction line for the in-situ C-14 at HEKAL AMS laboratory

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In this study we presented a new cosmogenic in-situ C-14 extraction line at the ICER laboratory, which is similar to be published in Fülöp et al. [1]. These extraction system used the phase transformation of quartz to cristobalite on high temperature in order to quantitatively extract the carbon as CO_2. The system consists of three independent components. 1: used for remove the atmospheric and meteoric C-14, 2: offline high-temperature (1650 °C) oven for extract and trapped the cosmogenic in-situ ^{14}C from quartz, 3: CO_2 gas purification and mass measurement line. After the extraction and cleaning, the purified CO_2 sapmles are measured with compact ^{14}C AMS system (Environ MICADAS) and the gas ion source interface. The extraction line allows for rapid sample throughput of about 6 samples per week. The sample masses ranging between 4 and 7 g of clean quartz.

Our first tests were on the borehole CO_2 blank gas and Cronus standards. The blank level of the whole line is very low. We get similar experiences and results as Fülöp et al. [1]. Purified quartz samples were sieved and used for analyse the fraction of 250 – 500 μm. The carbon yield from quartz samples are very good and we have the expected values.

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[1] Fülöp et al. (2019) Nuclear Inst. and Methods in Physics Research B **438,** 207-213.