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Calorimetric low temperatures detectors (LTDs) show some very desirable features for the energy spectroscopy of heavy ions: excellent energy resolution, $\delta E/E$ on the order of permille, excellent detection efficiency on the order of 100%, and very low sensibility to radiation damage. The operation principle is conceptually very simple: the energy deposited by the incident particle produces a temperature rise inversely proportional to the heat capacity of the absorber (which can be extremely low for small dielectric materials at low temperatures). Since almost all excitation processes in a solid finally end up in heat (phonons), LTDs have an intrinsic advantage over conventional detectors based on photon or charge production. In our case the absorber is a small (2.5 x 2.5 x 0.33 mm) sapphire crystal whose temperature rise is measured at the superconducting transition edge of an aluminum strip at about 1.5 K. For 30 MeV U-238 ions from the 3 MV tandem accelerator at the VERA lab, we have measured an energy resolution of 150 keV. This is an order of magnitude better than a gas ionisation detector and two orders of magnitude better than a surface barrier detector. We will present our recent results and discuss new applications for accelerator mass spectrometry when LTDs are combined with high resolution time–of–flight spectroscopy.

PH71 Study of stratosphere–troposphere exchange via $^{10}Be/^{7}Be$ isotope ratios

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The present study is part of the European project STACCATO (Influence of Stratosphere–Troposphere Exchange in a Changing Climate on Atmospheric Transport and Oxidation Capacity). Stratosphere–Troposphere Exchange (STE) is one of the key factors controlling the budgets of ozone, water vapor and other substances in both the troposphere and the lower stratosphere. However, its contribution to their ozone budget relative to photo–chemical ozone formation from natural and anthropogenic precursor emissions is still

uncertain. An international effort is made to estimate the strength of STE and its impact on tropospheric chemistry.

The two cosmogenic radioisotopes of beryllium, ^{10}Be and ^{7}Be have very different half-lives of 1.51 Ma and 53.4 d, respectively. The combination of production rates, half-lives and different residence times in the stratosphere and troposphere, respectively, results in ^{10}Be/^{7}Be isotope ratios which can be used as fingerprints for STE. This ratio helps to give a much improved estimate of STE. However, only few ^{10}Be measurements exist, because its detection requires the rather elaborate method of accelerator mass spectrometry (AMS).

At the AMS facility VERA we are now measuring the ^{10}Be content of air filters from the high-alpine stations 'Hoher Sonnblick', Austria, and 'Zugspitze', Germany. The ^{7}Be content is measured separately by decay counting. In this presentation, we want to describe the method of measuring ^{10}Be with AMS, and to discuss the results of first ^{10}Be/^{7}Be ratios.

PH72 Heavy-ion Accelerator Mass Spectrometry with a "small" accelerator

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VERA, the Vienna Environmental Research Accelerator, is based on a 3-MV Pelletron tandem accelerator and is designed to allow the transport of ions of all elements, from the lightest to the heaviest. The VERA heavy ion program tries to establish measurement methods which work for the long-lived radionuclides where suppression of isobars is not required. Among these are ^{129}I, ^{210}Pb, ^{236}U, and all heavier ions where no stable isobars exist.

To suppress neighboring masses, the resolution of VERA was increased, both by improving the ion optics of existing elements and by installing a new electrostatic separator after the analyzing magnet. Interfering ions which pass all beam filters are identified with a high-resolution time-of-flight system, using a 0.5 μg/cm^2 DLC (Diamond-Like Carbon) foil in the start detector, which substantially reduces beam straggling.

Compared to heavy ion AMS at large tandem accelerators (TV $\geq$8 MV) and for cases where stable isobar interference is absent, it is possible to offset the