Contribution ID: **154** Type: **Oral contribution**

AMS measurements of stellar cross sections across the nuclear chart

Thursday 29 June 2006 14:30 (20 minutes)

Accurate and precise cross-section data are the key ingredients to our understanding of stellar nucleosynthesis. Common techniques for these data comprise online time-of-flight measurements of reaction cross sections as well as offline methods like the activation technique. In cases of longer-lived nuclides or nuclides with an unfavourable decay scheme, counting atoms directly rather than their decay rates, is the far more sensitive method. Accelerator mass spectrometry (AMS) offers a powerful tool to measure cross sections independent on half-lives of reaction products.
At the Vienna Environmental Research Accelerator (VERA) we are pursuing a program to study cross sections relevant to nuclear astrophysics. In this context, various samples are irradiated in a quasi-stellar neutron spectrum of kT = 25 keV produced with the 7Li(p,n)7Be reaction at the 3.7MV Van de Graaff accelerator of Forschungszentrum Karlsruhe. The subsequent AMS measurements are performed at VERA. The main challenge in AMS is to discriminate isotopic and isobaric interferences. By extensive background studies the required sensitivity for cross section measurements has been demonstrated for various isotopes prior to the AMS measurements.
So far, the reactions 9Be(n,g)10Be, 13C(n,g)14C, 40Ca(n,g)41Ca, 54Fe(n,g)55Fe, and 209Bi(n,g)210Bi have been investigated. For some of these reactions no experimental results exist up to now. The implications of measured cross sections for various nucleosynthesis scenarios will be discussed.

Author: WALLNER, Anton (Institut für Isotopenforschung und Kernphysik, VERA, Univ. Wien)

Co-authors: Dr PRILLER, Alfred (Institut für Isotopenforschung und Kernphysik, VERA, Univ. Wien); Dr VOCKENHUBER, Christof (TRIUMF, 4004 Wesbrook Mall, Vancouver, BC, V6T 2A3, Canada); Dr KÄPPELER, Franz (Institut für Kernphysik, Forschungszentrum Karlsruhe, Postfach 3640, 76021 Karlsruhe, Germany); Dr DILLMANN, Iris (Institut für Kernphysik, Forschungszentrum Karlsruhe, Postfach 3640, 76021 Karlsruhe, Germany); Prof. PAUL, Michael (Racah Institute of Physics, Hebrew University, Jerusalem, Israel, 91904); Dr STEIER, Peter (Institut für Isotopenforschung und Kernphysik, VERA, Univ. Wien); Dr GOLSER, Robin (Institut für Isotopenforschung und Kernphysik, VERA, Univ. Wien); Prof. KUTSCHERA, Walter (Institut für Isotopenforschung und Kernphysik, VERA, Univ. Wien)

Presenter: WALLNER, Anton (Institut für Isotopenforschung und Kernphysik, VERA, Univ. Wien)

Session Classification: 13 Experiments in nuclear astrophysics III

Track Classification: Experiments in nuclear astrophysics