



E I N L A D U N G

zum gemeinsamen

V E R A – S M I – S E M I N A R

von

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**First experiments with a liquid-lithium based
high-intensity 25-keV neutron source**

A high-intensity neutron source based on a Liquid-Lithium Target (LiLiT) and the ${}^7\text{Li}(p,n)$ reaction was developed at SARAF (Soreq Applied Research Accelerator Facility, Israel) and is used for nuclear astrophysics experiments. The setup was commissioned with a 1.3 mA proton beam at 1.91 MeV, producing a neutron yield of $\sim 2 \times 10^{10}$ n/s, more than one order of magnitude larger than conventional ${}^7\text{Li}(p,n)$ -based neutron sources and peaked at ~ 25 keV. The LiLiT device consists of a high-velocity (> 4 m/s) vertical jet of liquid lithium (~ 200 °C) whose free surface is bombarded by the proton beam. The lithium jet acts both as the neutron-producing target and as a power beam dump. The target dissipates a peak power areal density of 2.5 kW/cm² and peak volume density of 0.5 MW/cm³ with no change of temperature or vacuum regime in the vacuum chamber. Preliminary results of Maxwellian-averaged cross section measurements for stable isotopes of Zr and Ce, performed by activation in the neutron flux of LiLiT, and nuclear-astrophysics experiments in planning will be described.

Donnerstag, 30. Jänner 2014, 16:30 Uhr
1090 Wien, Währinger Str. 17, "Kavalierstrakt",
1. Stock, Victor-Franz-Hess Hörsaal

R. Golser

W. Kutschera

E.M. Wild

E. Widmann