

INSTITUT FÜR ISOTOPENFORSCHUNG UND KERNPHYSIK  
DER UNIVERSITÄT WIEN

E I N L A D U N G

zum

S E M I N A R V O R T R A G

von

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**Nuclear Physics, a Tool for Humanitarian De-mining**

A great effort is needed to speed-up the de-mining process in order to have fewer mine victims (dead or mutilated). Up to now de-mining is mainly "hand work", and using metal detectors can give a very high false alarm rate. So there is a great interest in efficient methods that verify anomalies in the ground which are suspected to be mines.

The four main components of explosives H, C, N, and O can readily be identified by various nuclear methods. Because of their relative good penetration property and also good interaction probability with light elements neutrons qualify best for probes. Up to now only two types of neutron methods have been considered seriously: the so-called backscattering method based on the neutron thermalization by hydrogen and the neutron-gamma method (as used in the explosive detection device PELAN) which fingerprints all elements (isotopes) by their characteristic gamma emission.

A new method, MNBRP (Monoenergetic Neutron Back-scattering with Resonance Penetration) based on purely monoenergetic neutron technique, both for the penetration of the ground and the identification of the explosive has been proven experimentally to detect mines in a depth which is not accessible by the other methods. Simulations and experimental results are given and the necessary steps for the realization of a mine verifying device are discussed.

This talk will be given in English, if at least one of the persons present is not firm in German, otherwise in German.

**Donnerstag, 14. März 2002, 16:30 Uhr**

**1090 Wien, Währingerstr. 17, "Kavalierstrakt",  
1. Stock, Seminarraum von VERA**

P. Hille

W. Kutschera

