



独立行政法人理化学研究所 仁科加速器研究センター

第40回RIBF核物理セミナー

RIKEN Nishina Center for Accelerator Based Science

The 40th RIBF Nuclear Physics Seminar

**The New Radioactive Nuclear Beam Facility REX-ISOLDE/MINIBALL:  
Sub-Barrier Coulomb Excitation of  $^{30,32}\text{Mg}$  and the "Island of Inversion"**

**Dr. Heiko Scheit (RI Physics Lab. RIKEN)**

The main aspects of the new REX-ISOLDE facility and the MINIBALL HPGe gamma spectrometer will be presented. After a commissioning phase in 2002 two experimental campaigns were carried out in 2003/4 with the aim of shedding new light on the "Island of Inversion", a region in the nuclear chart, encompassing the very neutron-rich Na and Mg isotopes, that has attracted strong theoretical and experimental interest for over 30 years.

In these first studies with REX-ISOLDE and MINIBALL the reduced transition probabilities, the  $B(E2;0^+ \rightarrow 2^+)$  values, of the neutron-rich isotopes  $^{30,32}\text{Mg}$  were measured using the model-independent technique of low-energy "safe" Coulomb excitation.

While the  $B(E2)$ -value of  $^{30}\text{Mg}$  can be understood within the shell model in terms of a pure sd configuration, the large value of  $^{32}\text{Mg}$  is consistent with an almost pure 2p-2h configuration, i.e. a breakdown of the N=20 shell closure at Z=12. The reasons for this abrupt transition into the "Island of Inversion" are discussed.

**Dec. 26(Tue), 2006 10:30-  
Nishina Hall**

~~Dec. 19(Tue), 2006 13:30-  
RIBF Conf. Hall, RIBF Bldg. 2F~~

*The seminar will be given in English.  
Contact: RIBF Nuclear Physics Seminar Organizer  
seminar@ribf.riken.jp  
<http://ribf.riken.jp/~seminar>*