

On Line Nuclear Orientation (OLNO) in Europe

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Low temperature on-line nuclear orientation is a technique dedicated to the study of the decay of polarized exotic nuclei. A He3-He4 dilution refrigerator provides very low temperature (~10 mK) allowing nuclei to reach a large degree of polarization in the hyperfine field which exists at nuclei implanted into a ferromagnetic metal host. The decay products can be observed using proton, alpha or beta-particle detectors fitted within the cryostat and/or external gamma or neutron detectors, providing a very versatile instrument.

Oriented nuclei give access to a wide range of experiments. These include a precise measurement of nuclear moments using the NMR technique and the observation of beta-decay to, and gamma emission from, excited states in the daughter nucleus to study aspects of nuclear structure. As a special feature of LTNO, far-reaching studies of fundamental weak interactions and associated symmetries can be made as well as investigations into parity nonconservation.

The worldwide situation is that the only existing on-line system is the NICOLE experiment at ISOLDE/CERN. Another is being installed at ALTO: PolarEx. A common physics program is being built based on the complementarity of the two installations. We will present the most recent result obtained at ISOLDE with NICOLE, namely the measurement of the magnetic moment of ^{49}Sc [Phys.Rev.Lett. 109 (2012) 032504] and will outline new proposals, in particular the study of beta-delayed neutrons from oriented $^{137,139}\text{I}$ and $^{87,89}\text{Br}$.

The current status of the program at ALTO will be reported.

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