Statistical properties of the angular distribution of beta-delayed protons following the decay of oriented nuclei.

J.Rikovska [1,2] and N.J.Stone [1]

1. Department of Physics, Clarendon Laboratory, University of Oxford, Oxford, OX1 3PU, UK
2. Department of Chemistry, University of Maryland, College Park, MD 207 42, USA

The process of proton emission from highly excited states populated in beta-decay of precursor nuclei in medium and heavy region can be described by statistical models. Both the energy distribution of the protons, and the fluctuations in proton intensity have been discussed [1]. Nuclides near the proton-drip line are particularly suitable for such study as they have both a large Q_β value and can populate states well into the high level density region in the spectrum. Moreover, the proton separation energy in the emitter nucleus is low enough that proton emission is possible from a large number of these states.

Application of statistical models to the process of emission of beta-delayed protons requires some assumptions which have not been proven experimentally as yet. We will discuss in the contribution validity of the statistical approach in the view of new data that can be extracted from measurement of angular distribution of beta-delayed protons from parent nuclei, oriented at low temperatures. Such an experiment has never been performed before and is now ready for a test run at the ISOLDE facility at CERN, using oriented ^{116}Cs parent nucleus. We will report on details of the design and analysis of this experiment.

[1]P.G.Hansen, B.Jonson and A.Richter, Nucl.Phys. A518, 13 (1990)