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The spectrosopy of ^{162}Hf at low and high spins

The search for triaxial strongly deformed (TSD) structures in the rare earth region of the nuclear chart has been of interest recently. These structures have been predicted to occur for over 35 years [1]. The main aim of this project is to comprehensively study the nuclear spectroscopy of ^{162}Hf at low and high spins and to search for TSD structures. The research is also part of an investigation into the systematic behaviour of the N=90 nuclei. Our interest is in the systematics of the positive parity excited bands in N=90 nuclei and the behaviour of the negative parity bands as the proton number Z is increased leading to a reduction in the deformation of the ground state structure. A number of high spin structures with high dynamic moments of inertia have been observed in the heavy Hafnium isotopes [2-7]. Cranked Nilsson Strutinsky calculations predict that such bands are most likely associated with TSD structures originating from a positive-γ energy minimum which dominates at ultrahigh spins. The data was collected using the world class multi-detector gamma-ray spectrometers namely the AFRODITE (South Africa) and JUROGAM at Jyvaskyla (Finland). The high spin states were populated in the ^{110}Pd(^{56}Fe, 4n) reaction at a beam energy of 270 MeV at Jyvaskyla and the medium and low spin states at iThemba LABS using the ^{144}Sm(^{22}Ne, 4n) reaction at a beam energy of 110 MeV. The collected data was sorted using MTSort and was analyzed using RADWARE [8]. Results from both data sets will be presented.

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