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Isomer states in neutorn-rich 73,75,77Ni

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An experiment based on gamma-decay of isomer state in neutron-rich 77Ni produced from fragmentation of a 238U beam is proposed in order to reveal the neutron single particle energies associated with the N=40 and N=50 shell closures. Based on the lifetime of the 1/2- isomeric state in 77Ni an estimate or at least a lower limit on the energy of the 2+ state in 78Ni can be deduced. Energy and life time of the 1/2- state in lighter 73,75Ni isotopes, which can be measured simultaneously, is needed to reveal the structure of these nuclei from gamma spectroscopy.

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