

Study of neutron decoupling phenomenon in ^{20}C

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In recent years, significantly different contribution of neutrons and protons to the first excited states has been observed in several, light, neutron-rich nuclei. Especially, carbon isotopes have been intensively studied, but ^{20}C , the heaviest isotope reachable with the present experimental facilities, was not investigated. In order to make the measurements complete in the carbon isotopic chain, we have performed inelastic scattering experiments using proton and lead targets via gamma spectroscopic methods. Comparing the determined cross sections with those of coupled channel calculations, the neutron and proton deformation lengths have been derived. From these, the multipole neutron and proton transition matrix elements and consequently the contribution of neutrons and protons to the first excited state of ^{20}C have been deduced.

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