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M1 Transition strenght of the mixed-symmetry 2+ state of 132Te

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The one-phonon mixed-symmetry 2^+ of ^{132}Te is of high interest due to the specific structure of this nucleus, with two valence-proton particles and two valence-neutron holes with respect to the doubly-magic nucleus ^{132}Sn. In recent experiments, the second excited 2^+ state has been assigned as the one-phonon mixed-symmetry 2^+ state [1], due to the high B(M1) transition strength between this state and the 2^+_1 state, which is the proton-neutron symmetric counterpart of the mixed-symmetry state. However, the obtained value is highly uncertain and extraordinarily large with 5.4(3.5) μ_N^2, mainly due to the $50\,\%$ uncertainty in the reference value of its decay branching ratio to the 2^+_1 and 0^+_1 state [2].

By populating the 2^+_2 state in a two-neutron transfer reaction ^{130}Te(^{18}O,^{16}O)^{132}Te at IFIN-HH in Romania, it was now possible to obtain a more precise value for the B(M1) transition strength. This was achieved by determining the lifetime after performing a lineshape analysis of the deexcitation γ-rays using the Doppler-shift attenuation method.

[1] M. Danchev *et al.*, Phys. Rev. C **84** (2011) 061306(R)

[2] R. O. Hughes *et al.*, Phys. Rev. C **71** (2005) 044311

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