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Tests of collectivity in 98Zr by absolute transition rates

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Lifetimes of low-spin excited states in ^{98}Zr were measured using the recoil-distance Doppler-shift technique and the Doppler-shift attenuation method. The nucleus of interest was populated in a ^{96}Zr(^{18}O,^{16}O)^{98}Zr two-neutron transfer reaction at the Cologne FN Tandem accelerator giving access to the low-sping structure of the nucleus. Lifetimes of six excited states, of which four unknown, were measured. The deduced $B(E2)$ values were compared with Monte-Carlo shell model and interacting boson model with configuration mixing calculations. Both approaches reproduce well most of the data but leave challenging questions regarding the structure of some low-lying states. Most notable is the low collectivity of the $B(E2; 2_1^+ \rightarrow 0_2^+)$ which is not predicted by both models.

Authors: BLAZHEV, Andrey Atanasov (University of Cologne); ESMAYLZADEH, Arwin (University of Cologne); FRANSEN, Christoph Hermann (University of Cologne); JOLIE, Jan (University of Cologne); KNAFLA, Lukas (University of Cologne); Dr MÜLLER-GATERMANN, Claus (University of Cologne); RÉGIS, J.-M. (University of Cologne); WARR, Nigel Victor (University of Cologne)

Presenter: KARAYONCHEV, Vasil (University of Cologne, TRIUMF)

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