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# Recent results of Dubna collaboration: E1 toroidal mode, K-isomers in No isotopes, wavelet analysis of monopole excitations

A short review of some recent results of collaboration Dubna – Darmstadt – Erlangen - Bratislava - Prague – Johannesburg is presented. Theoretical analysis is performed within fully self-consistent quasiparticle random-phase approximation method with Skyrme forces.
As the first item, the exotic toroidal E1 mode is outlined. It is shown that this vortical mode is a general feature of atomic nuclei [1,2]. The overlap of the toroidal mode with pygmy dipole resonance is discussed. Using Darmstadt's (e,e') data, we show that this mode can be observed in inelastic scattering of electrons to back angles [3].

Next, K isomers in No isotopes are analyzed. It is shown that widely disputed 8- isomer in 254No can be unambiguously assigned as two-quasiparticle neutron configuration 7/2+[624], 9/2-[734].

Finally, wavelet analysis of iThemba (□□□') data [4] on monopole excitations in prolate 24Mg and oblate 28Si nuclei is presented. To discriminate different physical effects, the region of monopole giant resonance and region of the deformation-induced monopole-quadrupole coupling are considered separately. The impact of Landau damping to wavelet scales is scrutinized.

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[3] P. von Neumann-Cosel, V.O. Nesterenko, I. Brandherm, P.I. Vishnevskiy, P.-G. Reinhard, J. Kvasil, H. Matsubara, A. Repko, A. Richter, M. Scheck and A. Tamii, arXiv:2310.04736[nucl-ex], subm. to Phys. Rev. Lett.
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## Notes

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