

Exotic E1 resonances in nuclei

V. O. Nesterenko

Joint Institute for Nuclear Research, Dubna, Russia

e-mail: nester@theor.jinr.ru

The exotic E1 excitations (pygmy, compression, toroidal) near the particle thresholds are of a paramount interest for astrophysical application and construction of nuclear equation of state [1]. We provide a basic information on these excitations and explore their interplay [2], [3], [4], [5]. The main attention is paid to the relation of irrotational pygmy resonance and vortical toroidal mode. The last experimental and theoretical results for the search of the toroidal resonance in reaction (α, α') , (e, e') and (e, e', γ) are outlined [6]. Besides, we briefly inspect: i) interplay of toroidal and cluster features in light nuclei [7], ii) relation of nuclear toroidal flow with Hill's vortex in hydrodynamics [5], [6], iii) unusual radiation properties of toroidal sources and their manifestation in metamaterials.

References

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