

Electric dipole vorticity in nuclei

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ELECTRIC DIPOLE VORTICITY IN NUCLEI V.O. Nesterenko Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Moscow region, 141980, Russia During last decades, the intrinsic nuclear vorticity associated with toroidal E1 excitations attracts a high attention. We briefly discuss some basic aspects and recent progress in this activity: relation of the toroidal E1 resonance with Hill's vortex ring, interplay of the toroidal and pygmy dipole resonances [1-3], individual low-energy E1 toroidal states in light deformed nuclei [4]-[8], relation with cluster modes in light nuclei [7], possible ways for identification of individual toroidal states in experiment [8]. [1] A. Repko, P.-G. Reinhard, V.O. Nesterenko, and J. Kvasil, Phys. Rev. C 87, 024305 (2013). [2] V.O. Nesterenko, J. Kvasil, A. Repko, W. Kleinig, and P.-G. Reinhard, Phys. Atom. Nucl. 79, n.6, 842 (2016). [3] A. Repko, V.O. Nesterenko, J. Kvasil, and P.-G. Reinhard, Eur. Phys. J. A 55, 242 (2019). [4] V.O. Nesterenko, A. Repko, J. Kasil, and P.-G. Reinhard, Phys. Rev. Lett. 120, n.18, 182501 (2018). [5] V.O. Nesterenko, J. Kvasil, A. Repko, and P.-G. Reinhard, Eur. Phys. J. Web of Conf. 194, 03005 (2018). [6] Yoshiko Kanada-En'yo and Yuki Shikata, Phys. Rev. C 95 064319 (2017). [7] P. Adsley, V.O. Nesterenko, et al, Phys. Rev. C 103, 044315 (2021). [8] V.O. Nesterenko, A. Repko, J. Kvasil, and P.-G. Reinhard, Phys. Rev. C 100, 064302 (2019).

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