DIPOLE ELECTRIC AND MAGNETIC STRENGTHS IN ^{156}Gd

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In connection with recent NRF experiment for dipole spectra in ^{156}Gd [1], various E1 and M1 excitations in this nucleus are investigated in the framework of the fully self-consistent quasiparticle random phase approximation (QRPA) with Skyrme forces [2]. The low-energy pygmy dipole resonance (PDR), isovector E1 giant dipole resonance (GDR), isovector M1 low-energy orbital scissors resonance (OSR), M1 spin-flip giant resonance (SFGR) are covered. Besides, we consider a toroidal E1 resonance and low-energy M1 spin-flip states. The deformation splitting and dipole-octupole coupling of electric excitations are analyzed. Our calculations show a good agreement with E1 NRF data but disagree with M1 data at 4-6 MeV, where, in contradiction with our calculations and previous (p, p') data, almost no M1 strength was observed.

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2. V.O. Nesterenko, P.I. Vishnevskiy, P.-G. Reinhard, A. Repko and J. Kvasil, Eur. Phys. J. 60, 28 (2024).