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Spectral distributions of E1 and M1 strengths at PDR energies

We present systematic theoretical investigations of electromagnetic response functions where new modes of nuclear excitations are explored. The approach incorporates density functional theory and QRPA plus multi-phonon coupling. This allows for a consistent microscopical description of dierent complex excitations in stable and exotic nuclei [1, 2].
The analysis of QRPA transition densities and currents at low energies reveal a clear indication of specic signals of nuclear skin oscillations which are distinct from other surface vibrations and the giant resonances known from stable nuclei. These signals are found as well in dipole and quadrupole response functions and they are related to pygmy dipole and quadrupole resonances [1, 2]. Even though the pygmy dipole strength is mostly of electric character [3], the presence of skins is found to in uence also M1 strengths. In this aspect investigations of the ne structure of M1 spectral functions are discussed in comparison with experimental data [4]. The new observations contribute to the understanding of the spin dynamics of the nucleus in the presence of skin.

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