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Wavelet Analysis and Characteristic Scales of Dipole and Quadrupole Giant Resonances in ^{28}Si, ^{40}Ca, ^{48}Ca and ^{166}Er *

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Modern experiments allow to study the fine structure of giant resonances even in heavy nuclei. A novel method using continuous and discrete wavelet transforms provides extraction of characteristic energy scales of the giant resonances and a nearly model-independent determination of level densities. This technique is applied to diverse (e,e′) and (p,p′) data studying the magnetic quadrupole resonances in ^{48}Ca, electric dipole and quadrupole resonances in ^{28}Si , ^{40}Ca and ^{166}Er and various model calculations attempting to describe the fine structure.

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