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Noniterative finite amplitude methods for giant resonances and the application to the neutron radiative capture cross sections

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We calculate the electric dipole (E1) and the magnetic dipole (M1) giant resonances with noniterative finite amplitude methods and demonstrate how the fully microscopic density functional theory predicts the giant resonances without any phenomenological parameters. Then, we calculate neutron capture reactions based on the statistical Hauser-Feshbach theory with the result of E1 and M1 transitions and find that the capture cross sections for deformed nuclei are enhanced due to the contribution from the low energy M1 scissors mode.

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