ABSTRACT

Microscopic Neutron radiative capture reactions calculated with the noniterative finite amplitude method and the statistical Hauser-Feshbach theory

Hirokazu Sasaki

Lol Alamos National Laboratory

We derive quasiparticle random-phase approximation (QRPA) with noniterative finite amplitude method and calculate electric dipole (E1) and the magnetic dipole (M1) giant resonances. Then, we apply the QRPA result to the gamma-ray strength function and calculate the neutron radiative capture cross sections based on the statistical Hauser-Feshbach theory. We find that the low energy M1 scissors mode can enhance the capture cross sections for deformed gadolinium isotopes.