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The radiative strength function using the neutron-capture reaction on $^{151,153}\text{Eu}$

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Nuclear radiative strength functions are known best around the maximum of the giant electric dipole resonance, 10-20 MeV γ -ray energy. Extrapolation of the radiative strength functions, or the photon transmission coefficients, from the giant dipole resonance region to lower γ -ray energy region is problematic at best. We have made an experimental study of radiative strength functions in $^{152,154}\text{Eu}$ nuclei for γ -ray energies below 6 MeV. The highly efficient DANCE array coupled with the intense neutron beam at Los Alamos Neutron Science Center is used for the experiment. Neutron capture for incident neutron energies $<1\text{eV}$ up to 100 keV has been measured for $^{151,153}\text{Eu}$ targets. Stable Eu isotopes mass separated and electroplated on Be backings were used. This presentation focuses on resonances up to $E_n = 20\text{ eV}$. Properties of well-resolved, strong resonances in these two nuclei are examined. The parameters for most of these resonances are known. Detailed multiplicity information for each resonance is obtained employing the high granularity of the DANCE array. The radiative decay cascades corresponding to each resonance are obtained in the experiment. The measurements are compared to simulation of these cascades done with several different shapes for the radiative strength function. Comparison between the experimental data and simulation provides the first steps to determine the details of the radiative strength functions in these nuclei.

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