

## Systematic study of the $\gamma$ -ray strength function of samarium isotopes

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An upbend in the low-energy region of the  $\gamma$ -ray strength function has been observed previously in <sup>151,153</sup>Sm isotopes. This enhancement of the  $\gamma$ SF for energies below 2 MeV has profound implications on the neutron capture rates important for modeling the astrophysical  $r$ -process. A series of theoretical and experimental studies have been focused to understand the origin of this phenomenon. In this talk, the results of the measurements of  $\gamma$ SF for <sup>147,149,151,153</sup>Sm isotopes will be discussed. The nuclei of interest were populated via (p,d) reactions on pure <sup>148,150,152,154</sup>Sm targets and the reaction products were recorded by the Hyperion  $\gamma$ -ray array. The observed systematic highlights the interplay between scissors mode and the upbend. A Shell-model comparison shows reasonable agreement with the experimental  $\gamma$ SFs and confirms the correspondence between the upbend and scissors mode.

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