Study of multiphonon $\gamma\gamma$-band Of $^{156}Gd$ through Modified Soft Rotor Formula

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— The structure of multiphonon $\gamma\gamma$-band of $^{156}Gd$ is investigated by using the Modified Soft Rotor Formula (MSRF). The Modified Soft Rotor Formula proposed by Gupta et al. [1] is given as:

$$E(I) = E_K + \frac{\hbar^2 I(I + 1)}{2\theta(1 + \sigma I)}, \quad (1)$$

where $\theta$ is moment of inertia, $\sigma$ is known as softness parameter and $E_K$ is constant energy term. The calculated values of moment of inertia of $\gamma\gamma$-band are almost equal to the moment of inertia of $\gamma$-band. The study of K=2 $\gamma$-band and K=4 $\gamma\gamma$-band using MSRF yield good energy values. The small values of the softness parameter and positive values of moment of inertia are obtained for multiphonon band. The staggering pattern in $\gamma$-band and $\gamma\gamma$-band are also studied. Recently, the study of multiphonon $\gamma\gamma$-band in $^{112}Ru$ and isotopes of Mo have been done in Ref. [2].