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**The Spin Cut-off Factor of Nuclear Level Density** AZIZ BEHKAMI, MEHDI SOLTANI, Shiraz University, Physics Dept., MEHMET KILDIR, MEHRDAD GHOLAMI, Middle East Technical University — Since detailed at high resolution ( $n, \gamma$ ) and transfer reaction data has become available, we have initiated a systematic investigation of the data in order to deduce the parameters involved in the model calculations, in particular the spin cut-off factor. It is difficult to determine experimentally the spin cut-off factor  $\sigma$ . We have attempted to obtain  $\sigma$  near the ground state by fitting  $f(J)$  to the experimental spin distribution for various nuclei with  $\chi^2 = \sum_k \sum_{J_k} \{[n_k(J) - F_k(J)]^2 / n_k(J)\}$  where  $F_k = \sum_{J_k} n_k(J) / \sum_k f(J)$  and  $n_k(J)$  being the number of levels of spin  $J$  in nuclide  $k$  which has the spin window  $J_k^1$  and  $J_k^2$ . In addition the energy and mass dependence of the spin cut-off factor have been investigated using the microscopic model of BCS and reliable values for the spin cut-off factor which is often used in equilibrium decay calculations have been obtained. The energy dependence of the effective moment of inertia determined from the deduced spin cut-off factor,  $\sigma^2 = (\mathfrak{S}_{eff} / \hbar^2) T$  for all nuclei under study will also be presented and discussed.

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