

angular momentum, moment of inertia) represented as functions of the rotational frequency ω often show a characteristic multivalued behaviour in the form of an s shape. This fact is referred to as a backbending effect.

We shall see that the typical behavior of collective rotational bands in deformed nuclei is strongly related to the crossings between different rotational bands along the yrast line. We know that the nuclear states belonging to a given band are characterized by a definite parity and signature. Furthermore, bands of the same parity and signature can be distinguished with the help of other, additional quantum characteristics - the number of quasiparticles, the number of phonons. The band identity follows from the fact that in most of the cases the intraband electric quadrupole transitions are much faster than the related interband transitions.

A crossing of any two bands means that at certain $I = I_{\text{cross}}$ the energies of the corresponding two states belonging to different bands are approximately equal. In particular, a crossing of any two bands which form a portion of the yrast line leads apparently to a rearrangement in the intrinsic structure in the deexciting nucleus. Such a rearrangement is sometimes very abrupt.