# DECAY-OUT OF SUPERDEFORMED BANDS IN Pb ISOTOPES

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In a recent measurement, the excitation energy of the yrast superdeformed band in $^{192}$Pb was determined to be only $\approx$ 2 MeV above yrast at the point of decay [1]. This is slightly lower than the excitation of the yrast superdeformed band in the neighbouring even-even isotope $^{194}$Pb [2, 3], and significantly lower than the excitation energies of the superdeformed bands in the near-neighbour Hg isotopes [4,5].

At these relatively low excitation energies above yrast, the density of levels in the primary (low deformation) minimum will be low enough that the states are distinct in energy; that is, in these nuclei, the overlapping resonance region is not approached. It might therefore be expected that the probability of escaping the superdeformed minimum from any particular initial superdeformed level will be more sensitive to the structure of the normal levels than would be the case for superdeformed bands at higher excitations. However, both bands exhibit the rather abrupt loss of flux over around three consecutive levels thatis a generic feature of superdeformed bands.

The question then arises: How strongly does the density of normal states influence the decay out of the superdeformed well in these nuclei? Recently proposed models [6, 7] suggest different dependences on the average spacing of the normal levels and their $\gamma$-decay width. Our analysis of the decay in $^{192}$Pb and $^{194}$Pb [8] in terms of a two-level mixing model [6] suggests that, within this model, the loss of flux is almost independent of the properties of the normal deformed states in these two nuclei. If this is indeed the case, then it appears that the decay-out of the superdeformed bands in $^{192}$Pb and $^{194}$Pb is much more sensitive to changes in the barrier height than to changes in the density of states in the normal well.

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