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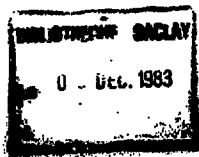
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GAMMA-GAMMA ENERGY CORRELATIONS STUDIES OF NUCLEI IN THE Xe-Ba REGION.

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Gamma-gamma energy correlations studies of nuclei in the Xe-Ba region

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The dynamic moments of inertia  $J_{band}^{(2)}$  of several Xe and Ba nucleides are investigated by means of the  $E_\gamma$ - $E_\gamma$  correlation technique. The experiments are performed using 6" x 8" hexagonal NaI(Tl) scintillators in two-dimensional coincidence arrangement on-line the Grenoble cyclotron. Ions of  $^{12}\text{C}$  with energies between 80 and 118 MeV are used in the present experiments.

For the case of  $^{122}\text{Sn}$  plus  $^{12}\text{C}$  at 80 MeV, it is found that 63 % (27 %) of the intensity of the discrete lines observed with a Ge(Li) spectrometer can be associated with the  $^{129}\text{Ba}$  ( $^{130}\text{Ba}$ ) final nucleide. If the kinetic moments of inertia of the ground bands are written  $J_{band}^{(1)} = J_0 + \omega^2 J_1$ , the values of  $J_0$  and  $J_1$  obtained from the discrete lines in  $^{130}\text{Ba}$  are in good agreement with those appearing in the corresponding expression for the dynamic moment of inertia, i.e.  $J_{band}^{(2)} = J_0 + 3\omega^2 J_1$ . This is shown in the figure (below, left) which thus includes  $J_{band}^{(2)}$  as deduced from the width of the valley in the correlation matrix. It may be noted that for rotational frequencies larger than the critical value corresponding to the first back-bend,  $J_{band}^{(2)}$  is fairly constant and approximately 90 % of the rigid rotor value ( $92 \text{ MeV}^{-1}$ ), possibly increasing to this value at  $(\hbar\omega)^2 \approx 0.33 \text{ MeV}^2$ .

For the  $^{112}\text{Sn} + ^{12}\text{C}$  system at 112 MeV, the final nuclei  $^{118}\text{Xe}$  and  $^{116}\text{Te}$  are identified to be responsible for 38 % each of the observed discrete lines. However, here the situation is a little different. No well defined valley can be seen at low rotational frequencies, and when the valley starts to develop at  $(\hbar\omega)^2 = 0.05 \text{ MeV}^2$ , it is a valley with bridges and fillings. The dynamic moment of inertia is found to exhibit a minimum at  $(\hbar\omega)^2 = 0.1 \text{ MeV}^2$ , i.e. before the first back-bend of the ground-band, which occurs at  $(\hbar\omega)^2 = 0.15 \text{ MeV}^2$ . For higher rotational frequencies, the moment of inertia is roughly constant and equal to  $60 \text{ MeV}^{-1}$  (cf. fig. below, right).

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