

Low-Spin States in the Isotones  $^{131}\text{Te}$ ,  $^{135}\text{Ba}$  and  
 $^{137}\text{Ce}$  Studied with the  $(n, \gamma)$  Reaction

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The neutron capture reactions  $^{134}\text{Ba}(n, \gamma)$ ,  $^{130}\text{Tc}(n, \gamma)$  and  $^{136}\text{Ce}(n, \gamma)$  are studied<sup>1)</sup>. Experiments were performed by using High Flux Beam Reactor at Brookhaven. In this way low-spin states below 2.5 MeV were determined in  $^{131}\text{Te}$ ,  $^{135}\text{Ba}$  and  $^{137}\text{Ce}$ . It is unlikely that any low-spin state ( $J \leq 5/2$ ) has been missed.

The present investigation of these nuclei was motivated by the results of an earlier nuclear orientation study of  $^{133}\text{Xe}$ <sup>2)</sup>, for which the levels and electromagnetic properties are compatible with the predictions of the cluster-vibration model, which was introduced by Alaga<sup>3,4)</sup>. In this model the odd-mass  $N=79$  nucleus is treated as a coupled system of three valence-shell neutron holes and quadrupole phonon excitation, thereby explicitly taking into account the Pauli principle in the neutron valence shell. In the present work a systematic study of the CVM energy spectra and branching ratios was performed, giving results in a rather good agreement with the experiment.

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  - 4) V.Paar, in Future Directions in Studies of Nuclei Far from Stability, ed. by J.H.Hamilton et al (North-Holland, Amsterdam, 1980) p.15