

A rare nuclear decay process: The internal conversion between bound atomic states

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Abstract. We shall report on the recently observed dependence of the lifetime of the first excited state in ^{125}Te on the ionic charge state. Then we shall give an interpretation of the dependence of the half-life in terms of a new type of nuclear internal conversion without emission of the electron into the continuum of electron energies. We have named this process internal conversion between bound atomic states or BIC. The resonant character of the BIC will be established and the main parameters governing the decay process will be discussed [1–3].

Finally the results of a recent experiment performed at the GANIL accelerator attempting to measure directly the value of the internal conversion coefficient associated with BIC in ^{125}Te ions with charge states ranging between 44+ and 48+ will be given.

In conclusion we shall discuss the relation between the BIC and nuclear excitation by electron transition, NEET, in the excitation of some nuclear isomeric states.

Keywords. Nuclear decay; internal conversion.

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References

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