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Light Ion Spectrometer for the study of multi-body decays of heavy nuclei.

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Abstract content
   (Max 300 words)

In our previous experiments [1], [2], [3], multiple manifestations of the "Collinear Cluster Tri-partition" (CCT) were identifed due to the features observed. In recent experiments a specific CCT mode based on the lost double magic 132Sn cluster was observed. This mode has been referred to as "Sn-lost" CCT mode. In this mode the Sn cluster can be imagined to move in a cylinder-like configuration that consists of residual nucleus. Two light fragments accompanying this cluster were detected in our previous experiments with the Sn missing.

The question that arises in the analysis of the "Sn-lost" CCT mode is whether 132Sn can be replaced by the double magic 208Pb in this decay mode. Theoretical indications of such a mode were obtained in [4]. These theoretical indications were observed when the potential energy of the fissioning nucleus of 252Cf was investigated with respect to a function of parameter Q which is proportional to the quadrupole moment of the system that defines the elongation at scission point.

Considering the question of whether 132Sn can be replaced by double magic 208Pb, and if that is the case then this will lead to a new type of lead radioactivity. Searching for such a mode is one of the goals for creating a LIS setup which will produce better statistics and more precise time-of-flights measurements. In this paper experimental aspects of the LIS setup which will be used in the investigation of the "Sn-lost" CCT mode will be discussed.

References

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