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Status of the study of multi-body decays of heavy nuclei using the modified Light Ions Spectrometer.

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Abstract content
   (Max 300 words)

In our previous experiments [1], [2] multiple manifestations of a new ternary decay of low excited nuclei called "Collinear Cluster Tri-partition" (CCT) were identified. This was due to features of the process observed. Recently a specific CCT mode was observed based on the double magic 132Sn cluster [3]. This unusual decay channel was revealed under the framework of the "missing mass" method, where only two fission fragments were actually detected with the third one missing. Unfortunately the data from our previous experiments suffered from plasma delay and pulse height defect (PHD). The PHD was solved with the use of a special procedure as was presented in our previous work reference [4].

A new LIS setup as described in reference [4] was designed to solve the challenge of plasma delay but results from this setup suffered from background noise and poor mass resolution. To improve on this we have modified the LIS setup by increasing the flight between the spectrometer arms from 84mm to 170mm. This increase in the flight path has improved the mass resolution from 6 amu to 3 amu. The modified LIS setup also enables us to separate scattered or background events from real fission fragments events. In this paper aspects of the modified LIS setup are discussed and preliminary results are presented. The results show a clear separation between background noise and real events.

References

1. Pyatkov Yu.V. et al., Romanian Reports in Physics 59 (2007) p 388
2. Kamanin D.V. et al., Int. Journal of Modern Physics E 17 (2008) p 2250
3. Pyatkov Yu.V. et al.,Eur. Phys. J. A 45 (2010) p 29
4. Malaza V.D. et al. Proc SAIP conf 2012, Pretoria, South Africa 9-13 Ju 2012

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