



Investigation of scintillation detectors for relativistic heavy ion calorimetry

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HOW TO DETERMINE MASSES AT RELATIVISTIC ENERGIES ?

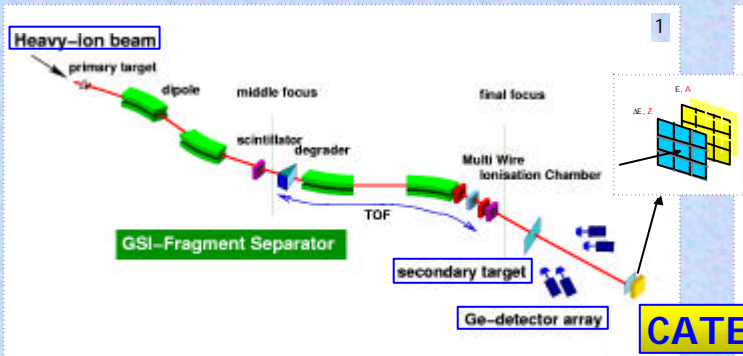


Fig.1. The experimental set-up [1], [2].

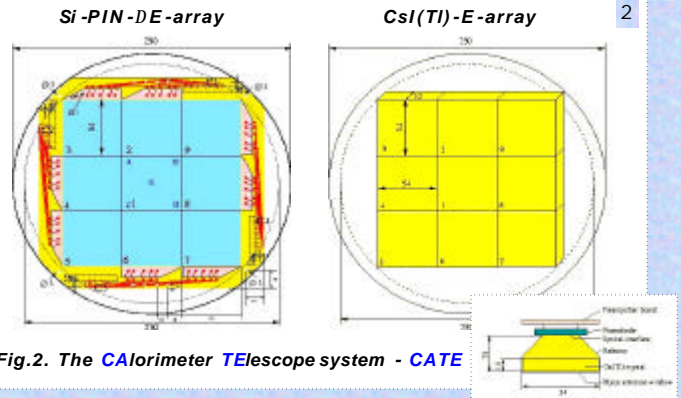


Fig.2. The Calorimeter Telescope system - CATE

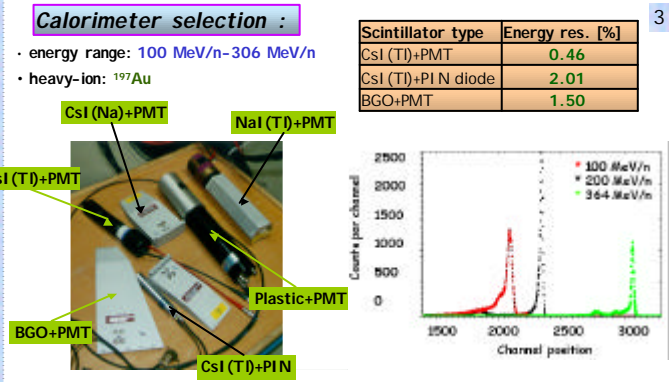


Fig.4. Response of the CsI(Tl)+PMT scintillator.

Fig.3. The investigated scintillators [3].

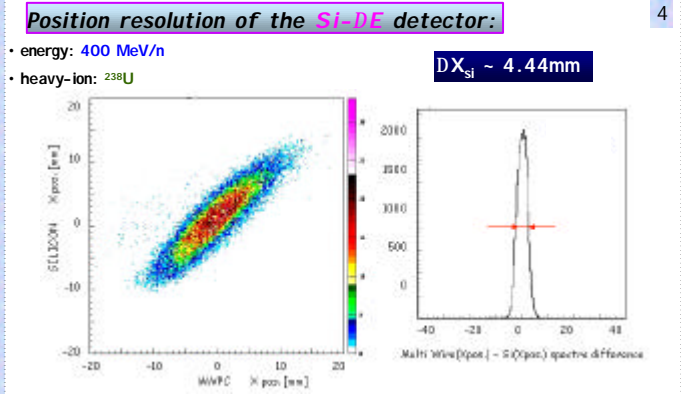


Fig.5. Correlation of the position of the Si-DE detector with the position of a Multi Wire Proportional Chamber ($DX \sim 1\text{mm}$).

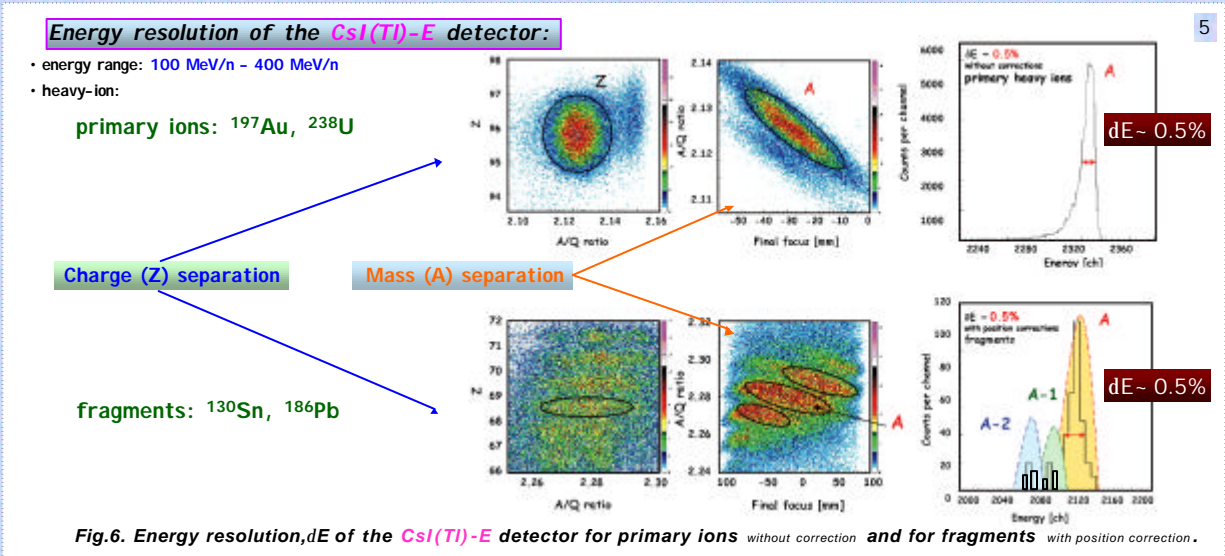


Fig.6. Energy resolution, dE of the CsI(Tl)-E detector for primary ions without correction and for fragments with position correction.

References:

- [1] http://www-gsi-vms.gsi.de/db/html/eb_at_gsi.html
- [2] <http://www-wnt.gsi.de/frs/index.asp>
- [3] <http://www-abx.gsi.de/~lozeva/thesis/>
- [4] http://www-land.gsi.de/a_new_land/experiments

The in-beam investigation of the CATE system revealed a position resolution of 4.4mm and an energy resolution of 0.5% corresponding to a mass resolution $\Delta A \sim 1/200$. In a previous measurement [4] the charge resolution of the Si-detector has already been determined to be $\Delta Z \sim 1/200$. Thus CATE is well suited for mass and charge determination of relativistic heavy-ions and will be employed in the RISING [1] project at GSI.