energy resolution as a function of source energy had been investigated. The result is shown in Fig. 1(d). The curve is fitting result for $a/E^{1/2}$ formula[1-3]. It shows better for the result.

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5 - 18 Measurement of ΔE-E Telescope Detector for Light Charged Particles

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Spallation reaction which is high energy proton after accelerated bombard heavy metal target play an important role in application of the accelerator driven subcritical reactors (ADS) for nuclear waste transmutation. Not only the strong neutron shower but also large number of LCPs would be produced in the reaction. It is very useful for spallation reaction to study produced LCPs[1-3].

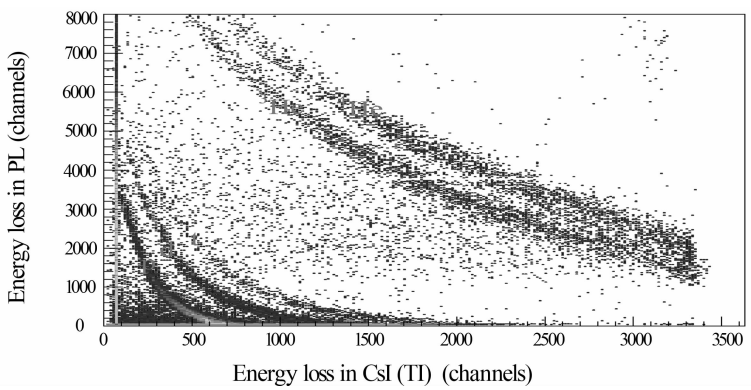

Fig. 1 Correlation of energy loss and residual energy measured with the ΔE-E telescope detector{350 MeV/u ^{12}C + (18 cm thickness) H_2O}. Hydrogen and helium isotopes can be well separated.

In this study, we had measured LCPs by using ΔE-E telescope detector. The telescope consisted of two different scintillation detectors. The energy loss ΔE of charged particles was measured by the $10\times10\times0.5$ cm^3 plastic scintillator. It was coupled through a light guide to the HAMAMATSU H7195 PMT. The total energy E of charged particles was measured by stopping the particles in the $\phi5\times15$ cm^3 CsI(Tl) crystal. The CsI(Tl) crystal was directly coupled to the HAMAMATSU H7195 PMT. Beam ^{12}C at 350 MeV was incident on 18 cm thick water target.

The measured spectrum has been shown in Fig. 1. In the diagram, it is seen that light charged particles (p, d, t, ^{3}He, ^{4}He) are very clearly separated. These results provide the effective foundation for studying spallation reaction.

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