

A novel method to discriminate Z and kinetic energy of pass-through ions in active silicon telescopes: off line and real time capabilities for ALTEA detector.

L. Di Fino, A. Ciccotelli, M. Larosa, C. La Tessa, L. Narici, P. Picozza, V. Zaconte

INFN and University of Rome Tor Vergata, Department of Physics, Via della Ricerca Scientifica 1, 00133 Rome, Italy

Silicon telescopes provide information about energy released in silicon by each impinging ion. ALTEA internal trigger needs all planes to be hit. One of the major analysis task is to retrieve information about the charge Z and the input energy E_{in} of these particles. The major challenge (for non stopping ions) is that the same energy on each plane of the telescope can be delivered by different combinations of Z and E_{in} . However if considered all planes together (six in the case of ALTEA, discussed here) the solution for an ideal noiseless situation should be unique. A real case is more difficult to treat.

In this presentation we show a new approach to this recognition problem.

We prepare a simulated matrix of data, containing in each line the energy released on each of the six planes by ions of different Z (1-26) and different E_{in} (up to 10 GeV/n). Data from our ALTEA telescopes are then compared to all lines of the matrix and the best fit is chosen.

Several parameters which can be optimized are discussed:

- i) the energy step in the simulated matrix;
- ii) the matching algorithm
- iii) the sorting and ranking of the results

Test results with simulated and real data are presented.