

Performances of the prototype particle detectors for the newly developed BESS-Polar superconducting spectrometer were verified.

A timing resolution of a scintillation counter hodoscope, called M-TOF, was tested. A M-TOF consists of eight $1.5 \text{ cm} \times 1 \text{ m}$ scintillator pads, optical fiber light guide and a 8-anode PMT. A timing resolution below 250 ps for each pad was obtained for 0.5 GeV/c protons, which is better than the designed value. For MIP events, a timing resolution below 600 ps was achieved. (Fig. 1)

A performance of a Time-of-Flight scintillator pad was also tested. Since the thickness of the pad is reduced to 1 cm in order to reduce the material along the incident particle in the BESS-Polar experiment, timing resolution of the counter is expected to be worse compared to the conventional BESS ToF counter. Timing resolution of 85 ps was obtained for MIP, which is consistent with the designed value.

A performance of a silica aerogel Cherenkov counter was checked. In the beamtest, silica Aerogel and PMTs could be partially mounted. Extrapolating the signal amplitude from the prototype detector, nine to ten photoelectrons can be expected for $\beta \sim 1$ particles in the flight module.

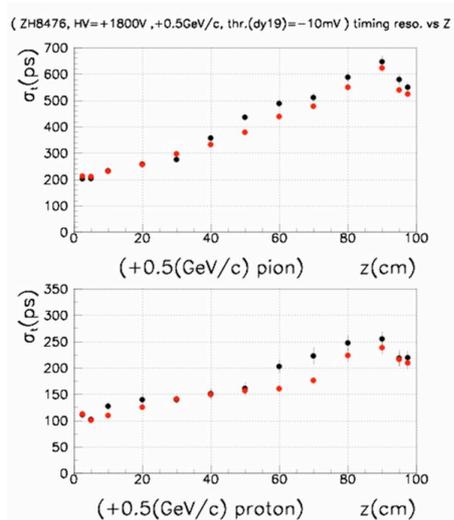


Fig. 1: Position dependence of the M-TOF timing resolution for 0.5 GeV/c pions (top) and protons (bottom).