

THE NAGOYA COSMIC-RAY MUON SPECTROMETER III

II TRACK DETECTOR

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ABSTRACT

Not only to obtain the precise locations of particles, but also to get some informations about the correspondences between segments of trajectories, we utilize the twelve wide gap spark chambers as the track detectors of the Nagoya cosmic-ray muon spectrometer (1).

The area of each chamber is $150 \times 70 \text{ cm}^2$ and the width of a gap is 5 cm. The gas used is He at the atmospheric pressure. Each three pairs of them are placed on both sides of the deflection magnet. All images of sparks for each event are projected through the mirror system and recorded by two cameras stereoscopically.

The mean detection efficiency of each chamber is $95 \pm 2 \%$ and the spacial resolution (jitter and drift) obtained from the prototype-experiment (2) is 0.12 mm. Maximum detectable momentum of our spectrometer is estimated at about 10 TeV/c taking into account of these characteristics together with the effects of the energy loss and multiple Coulomb scattering of muons in the iron magnet (3).

All the chambers have already installed in the spectrometer and they worked well in test runs of full system. Now, we are operating this spectrometer to get the maximum detectable momentum experimentally with these track detection system.

References.

1. Kamiya, Y. et al., paper presented to this conference, HE 5.2-2.
2. Shibata, S. et al., 15th ICRC, Plovdiv, 9, 56 (1977)
3. Kamiya, Y. et al., 17th ICRC, Paris, 9, 336 (1981)