

Its mass resolution will be better than 100 MeV at around 10 GeV, sufficient to separate all resonance states. It consists of a composite absorber ($\sim 10 \lambda_{\text{int}}$), made with layers of both high and low Z materials, starting 90 cm from the vertex, a large dipole magnet with a 3 Tm field integral placed outside the L3 magnet, and 10 planes of thin, high-granularity tracking stations. A second absorber ($\sim 7.2 \lambda_{\text{int}}$ or iron) at the end of the spectrometer and four more detector planes are used for muon identification and triggering. The spectrometer is shielded throughout its length by a dense absorber tube, of about 60 cm outer diameter, which surrounds the beam pipe.

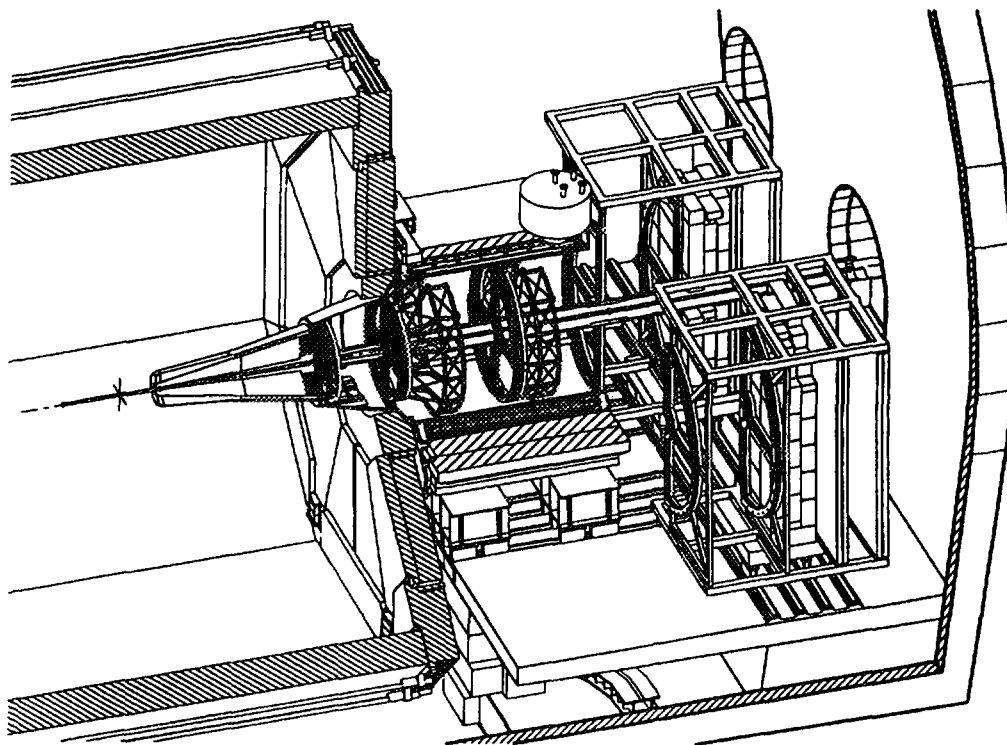


Fig.2 Conceptual layout of the muon arm integrated into ALICE.

- [1] ALICE Collaboration, Technical Proposal, CERN/LHCC 95-71, 1995
- [2] ALICE Collaboration, The Forward Muon Spectrometer of ALICE, CERN/LHCC 9632, 1996

6.14 The WASA project at CELSIUS accelerator

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The main aim of the international WASA Collaboration at the CELSIUS Storage Ring in Uppsala is the study of rare decays of π^0 and η mesons. These decays give knowledge about fundamental symmetries, meson form factors and chiral perturbation theory. The mesons will be produced in the interactions of the circulating proton beam with a frozen hydrogen or deuteron pellet target.

Extensive simulation studies have been made of both production and decay processes. We also took part in the mechanical design of the CsI calorimeter and the supports. A multi input trigger logic unit based on the programmable logic chip has been designed and built. The device was used with the new amplifier-discriminators to perform the multiplicity trigger. [4].

In Warsaw the 146 detectors which will be arranged in the form of a barrel for 4π WASA apparatus were manufactured and tested (Fig.1). The Plastic Scintillator Barrel will be placed after the vertex drift chamber inside a superconducting coil. The detector will provide a signal for a fast trigger and will give information about the energy loss for charged particle identification.

At present the near threshold of η meson production has been studied [1] in the first stage of the detector setup called WASA PROMICE [2]. It consists of a forward spectrometer, which covers scattering angle less than 22 degrees, with respect to the beam and two side telescopes consisting of 56 CsI(Na) crystal each. The Collaboration measured the $pp \rightarrow pp\eta$ cross section at six energies close to threshold



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using an internal cluster gas jet target. It permits us to determine the cross section energy dependence that gives new information on ηp and ηpp interaction.

In the same set-up the first exclusive measurement was performed of the two charged pions production in proton - proton collisions at 750 MeV. In this experiment a narrow peak was observed in the $pp\pi\pi$ invariant mass spectrum at 2063 ± 2 MeV [3]. The position of the peak is in agreement with the hypothesis of the exotic d dibaryon. The existence of such a state explains in a natural way the peculiarities observed in double charge exchange reactions on nuclei. The analysis of new data collected at 725 MeV and 775 MeV is in progress.

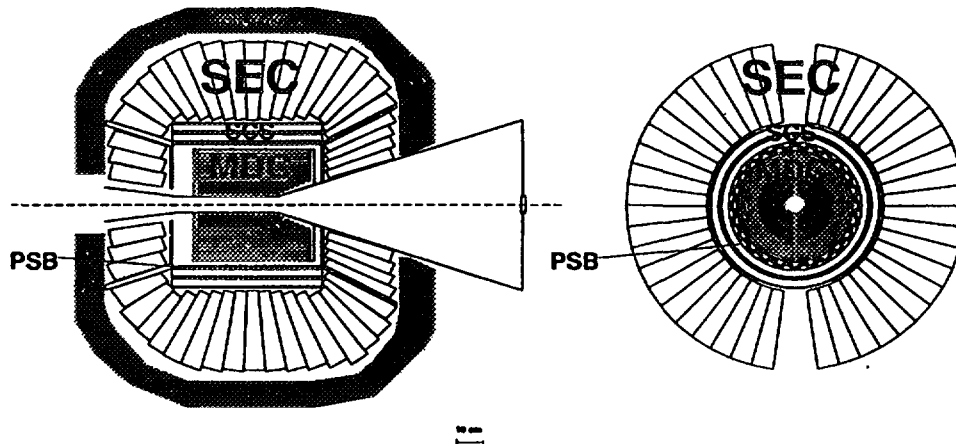


Fig.1 Schematic view of the WASA 4π detector. PSB stands for Plastic Scintillator Barrel.

In 1996 a run was performed with 1037 MeV energy of the incident protons. The protons interacted with a cluster jet deuteron target. The data analysis of $pd \rightarrow npp$, $pd \rightarrow ppp\pi$ and $pd \rightarrow ppn\gamma$ reactions are in progress in the kinematics far from the quasi-free interaction region.

A new low cost amplifier discriminator for use with vertex chambers, proportional multiwire fast chambers fast plastic scintillating detectors has been constructed. The prototypes have been successfully tested with the new ΔE detectors during Spring and Autumn'96 WASA runs.

- [1] H.Calen, A.Kupść, J.Stepaniak et al., Phys.Lett. B366 (1996) 39
- [2] W.Brodowski, A.Kupść, P.Marciniewski, A.Nawrot, J.Stepaniak et al., Z.f.Phys. A355 (1996) 5
- [3] H.Calen, A.Kupść, P.Marciniewski, A.Nawrot, J.Stepaniak et al., Nucl.Instr.and Meth. A379(1996) 57
- [4] L.Gustafsson, P.Marciniewski and Zernov, Nucl.Instr. and Meth. A379 (1996) 335