Status of FINUDA Experiment

L. Benussi[a], M. Bertani[a], S. Bianco[a], F.L. Fabbri[a], P. Gianotti[a], M. Giardoni[a], V. Lucherini[a], A. Mecozzi[a], E. Pace[a], L. Passamonti[a], D. Pierluigi[a], F. Pompili[a], N. Qaiser[b], A. Russo[a], S. Sarwar[a], S. Tomassini[a].

[a]INFN Laboratori Nazionali di Frascati, Frascati, Italy
[b]Pakistan Atomic Energy Commission, Islamabad, Pakistan

Abstract

The status of the FINUDA experiment is reported and the achievements in the last months described

1 Introduction

FINUDA (**FI**sica **NU**cleare a **DA**ϕne) is a spectrometer built to study Λ-hypernuclei levels with high resolution and counting rate, and to measure their non-mesonic decay in the same apparatus. The status of the experiment (detectors, magnet) is briefly described.

2 Status of detectors and magnet

All FINUDA detectors have been built and tested. During 1999 and 2000 several data taking runs have been performed with all type of FINUDA detectors installed on the mechanical support of the set up (Clepsydra). The automatic, remotely controlled system (robot) for manipulation of vertex detectors on the FINUDA Be vacuum pipe has been build and tested, showing the required performance (precision and position repeteability). During the two shut-down periods of DAΦNE (begining of 1999 and 2000) the FINUDA superconducting magnet has been installed in the experimental pit, and successively cooled and energized in order to verify the operation of the magnet and fix any problem. During the same period all the cabling of the experiment has been installed. A new, original system, based on optical fibers and using the principle of Bragg interferometry has been developed and tested: it will allow to continuosly monitor, with a precision of few micron, the actual position of vertex detectors during data taking. The assembly of the full detector has been realized; every Institution of the Collaboration has mounted its specific device in the mechanical support that hold the whole Finuda Detector now standing in the ASTRA assembling Hall of the Frascati Laboratory. The apparatus is now under routinely test with cosmics ray to extract the performances of the detectors

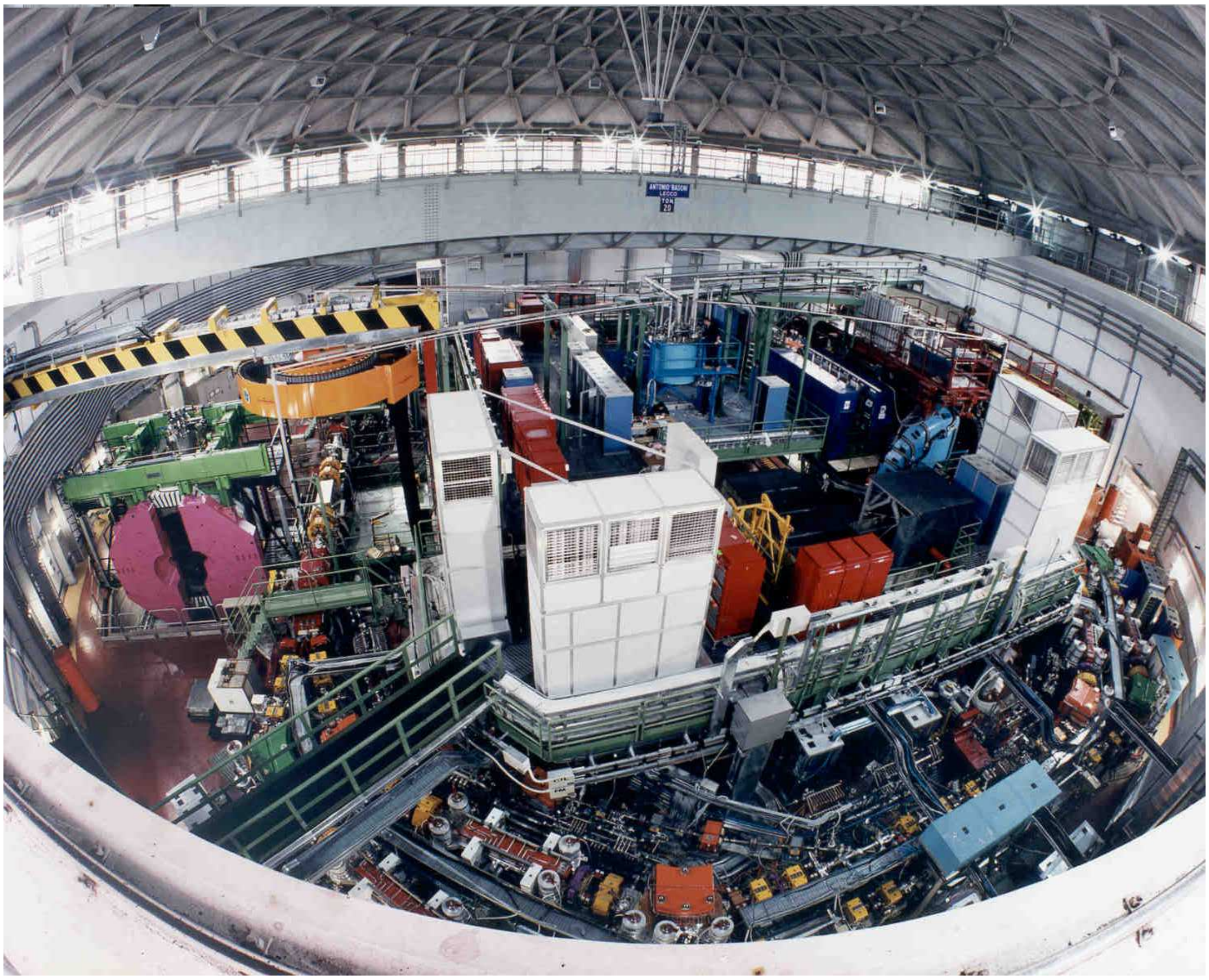

Figure 1: The FINUDA magnet inside the pit.

which turned out to be as or better than the prototypes. The analysis of cosmic ray data, moreover, will allow to study calibration constants and systematic effets on detector response and verify the actual geometry. The data taking with cosmic rays also successfully tested the DAQ software and allowed to refine the off-line software.

2.1 The straw tube detector

For what concerns the detector of specific competence of the Frascati group, the straw-barrel, the obtained performances are as 150 micron spatial resolution with a mixture of AR-Ethane (50-50), while a resolution of 40 micron can be achived with DME. A new tracking program based on the straw signals alone, which do not require as the actual a foreing seed from other detector of the spectrometer, is under preparation. The hermeticity of the 2004 straw in the barrel has been monitored for gas leakeges: the charactering number is less than 5. All the suppling, monitoring, alerting program of the straw system (gas production and continous filling, high and low power supply, leakgeas controller, allarm safety systems) have been operated and qualified for running the experiment. The detector in now waiting to be installed on the Daϕne pit.