Contribution ID: **286** Type: **Poster**

A Novel Approach for Fast Scanning of Nuclear Emulsions with Continuous Motion of the Microscope Stage

Wednesday, 23 May 2012 11:26 (0 minutes)

Nuclear emulsions have been used in particle physics experiments for many decades because of their unique spatial resolution. The use of nuclear emulsions as precise tracking detectors in large experiments has recently been made possible due to advances in the production of emulsion films and to the development of very fast automatic scanning devices. The present scanning speed of the European Scanning System (ESS), which has been developed within the OPERA Collaboration, is about 20 cm^2/h. In addition to the scanning of OPERA films, the ESS is used for other applications with ever-growing demands for improved scanning speed, such as the muon radiography of volcanoes. In order to further increase the scanning speed of the ESS, we are testing a novel approach different from the standard stop-and-go motion of the microscope stage in the horizontal plane. Indeed we perform data acquisition with the stage moving at constant speed, using an objective lens with wide field of view. Unlike the implementation realized in Japan where the movement of objective lens and stage are synchronized to pile up images of the same view, in this approach only the stage is moving horizontally. Thus images at different depths are not fully overlapped and special care is needed in the reconstruction. This approach can give a substantial increase in the scanning speed, especially for thin emulsion layers and wide field of view.

Optional extended abstract

If special care is taken, the emulsion data quality can be as good as with the standard stop-and-go approach. This technique allows to double the scanning speed of the ESS, bringing it to 40 cm2/hour without any hardware modification.

for the collaboration

OPERA Italian scanning labs

Primary author: Dr ALEXANDROV, Andrey (INFN - Napoli)

Presenter: Dr ALEXANDROV, Andrey (INFN - Napoli)

Session Classification: Front End, Trigger, DAQ and Data Management - Poster Session

Track Classification: P4 - Front End, Trigger, DAQ and Data Management