Contribution ID: **23** Type: **Oral**

Design of a thin internal 12C target for antiproton interactions inside the HESR ring at FAIR

Thursday, 17 November 2016 11:30 (30 minutes)

H. Younis1, F.Iazzi2, F.Balestra2, R.Introzzi2, A. Lavagno2, M.Ajaz3 and Kamal Hussain Khan4

Abstract: In the future complex FAIR (Facility for Antiproton and Ion Research) experiments, the HESR (High Energy Storage Ring) will provide antiprotons as projectiles in the momentum range of 1.5-15 GeV/c with a resolution up to 10-5. These antiproton projectiles are helpful in study of charm and strangeness of Double hyper nuclei physics [1]. The FAIR project will supply intense beam of antiprotons from the HESR ring. For carrying all these nuclear reactions it is essential to insert an internal target in HESR. By inserting a nuclear target inside the antiproton ring will leads into two main drawbacks: a large background on the detectors due the overwhelming amount of annihilations and a strong depletion of the beam due to the all the hadronic and coulomb interactions of the antiprotons with 12C nuclei [2]. An appropriate target with precise thickness can minimize these undesirable effects. In this regard a thin diamond target with two-wire shape prototype have been analyzed [3]. The wire shaped diamond target has been obtained using femto-edged laser. Mechanical properties of nuclear target like hardness, purity and thickness of the target have been analyzed by using back scattering technique. For this purpose the target is irradiated with 1.5 MeV beams of protons. Further this prototype has been submitted to micro-Raman Spectroscopy in order check the phase change in the target. The results show performances, which satisfy the experimental requirements.

Keywords: Double Hyper-nuclei; Diamond Target; Femto-edged Laser; Ion Storage ring; micro-Raman Spectroscopy

Reference:

[1] F. Ferro et al. 2007 Nucl. Phys. A 789 209
[2] H. Younis et al. 2013 J. Radioanal. Nucl. Chem. 299, issue 2 951
[3] H. Younis et al. 2014 JINST 9 P04012

Primary author: Dr YOUNIS, Hannan (Comsats Institute of Information Technology Islamabad)

Presenter: Dr YOUNIS, Hannan (Comsats Institute of Information Technology Islamabad)

Session Classification: Session 9

Track Classification: Plenary