Szanowni Państwo,
Rozpoczynamy cotygodniowe spotkania „Seminarium Fizyki Jądra Atomowego”.
Zgodnie z poleceniem władz UW i Wydziału Fizyki, zajęcia te będą odbywały się w trybie „online” za pomocą programu „zoom.us”. Link (ten sam dla wszystkich spotkań), aktywny w każdy czwartek w godz. od 10.00 do 12.00 to:

https://us02web.zoom.us/j/86759935850?pwd=ejZhaHBjUTNncVVDZFJTRnVaYW9MQT09
ID: 867 5993 5850
Passcode: 909432

Pierwsze seminarium, które odbędzie się w czwartek 15 października 2020, wygłosi Dr Giulia Colucci z ŚLCJ UW.

Tytuł seminarium:

“A fast ionization chamber for the detection of fusion-evaporation residues produced by the exotic beams of SPES: design, tests and first experiment”

Abstract:
Heavy-ion fusion at near-barrier energies is a complex phenomenon. The availability of radioactive beams has opened new possibilities to investigate these reactions - the very neutron-rich beams of the SPES facility [1] at relatively low intensities may enable the study of near- and sub-barrier fusion to exotic systems. However, the use of RIBs is often very challenging because of the low available intensities and the forward focusing of the fusion evaporation residues (ER). Thus, applications of radioactive beams require detection systems with very high efficiency and detectors that avoid unnecessary energy straggling and angular dispersion and assure fast response.
A new set-up for fusion cross section measurements, especially designed for the low intensity beams which will be delivered by the SPES facility, has been developed and installed and it is presently in use at the National Laboratories of Legnaro (LNL), in its initial operation phase. The set-up is inspired on a similar one built at Oak Ridge [2] some years ago, with a significant improvement due to the use of a very fast ionization chamber (IC). This new fast IC is designed to ensure a high-counting-rate particle identification for fusion studies involving exotic beams up to 10^5 pps. Indeed, the IC will be placed at 0° with respect to the beam direction without filtering out the beam ions in any way. To reduce the response time of the ionization chamber, a design using a series of tilted electrodes has been adopted [3]. The aim is to be able to detect and identify fusion events within a counting rate up to 100-200 kHz. The set-up already existing at LNL for fusion measurements (based on the electrostatic beam deflector) has been upgraded by using the new IC and will remain in use for experiments with high-intensity stable (and upcoming exotic) beams. Several tests with stable beams have been performed to optimize the performance of the Fast IC [4]. The detector has been also employed for the experimental study of sub-barrier fusion in the ^{36}S + ^{50}Ti, ^{51}V systems [5]. Aim of the experiment was to investigate possible effects of the non-zero spin of ^{51}V ground state on the sub-barrier excitation function and on the shape of the barrier distribution. The fundamental concepts of a IC with fast response will be presented, the results of the in-beam tests and experiment performed will be showed in this seminar.

REFERENCES
[1] The SPES project: technical and scientific reports http://www.lnl.infn.it/ spes/
[2] D. Shapira et al., Nucl. Instr. Meth. Phys. Res. A 551, 330 (2005)
[3] K.Y. Chae et al., Nucl. Instr. Meth. Phys. Res. A 751, 6 (2014)
[4] G.Colucci et al., Acta Phys. Pol. B **50**, 573 (2019)
[5] G. Colucci at al., Eur. Phys. J. A 55, 111 (2019)

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