

Joint seminar of the NPI of the CAS

Mgr. Daniil Koliadko,
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High Priority Request List cross section measurements: ${}^7\text{Li}_{(d,x)}{}^3\text{H}/{}^7\text{Be}$ and ${}^{39}\text{K}_{(n,p)}{}^{39}\text{Ar}$

The Nuclear Energy Agency's High Priority Nuclear Data Request List (HPRL) is a compilation of the highest priority nuclear data requirements. The U-120M cyclotron of the Nuclear Physics Institute of the Czech Academy of Sciences is a suitable tool for studies of several reactions from this list. I will present the measurements of the ${}^7\text{Be}$ and tritium production in the lithium after irradiation with deuterons (ID: 116H and 117H) and the validation measurement for the ${}^{39}\text{Ar}$ production in ${}^{39}\text{K}$ after irradiation with neutrons (ID: 45H). The U-120M cyclotron is used to accelerate deuterons up to 20 MeV. The deuterons are directed to Li_2CO_3 pellets with 100% enriched ${}^7\text{Li}$. After the irradiation, the ${}^7\text{Be}$ production is measured by gamma spectrometry, and tritium production is measured by dissolving the pellet in the liquid scintillator and with the aid of scintillation equipment. For the measurement of the ${}^{39}\text{Ar}$ production in the reaction ${}^{39}\text{K}_{(n,p)}{}^{39}\text{Ar}$, the muscovite mica foil is irradiated using well known continuous neutron spectrum from the p+Be neutron generator. The beta spectra from the decay of ${}^{40}\text{K}$, ${}^{39}\text{Ar}$, and other beta emitters in the mica foil are measured with a Si(Li) detector.

Ing. Artem Isakov,
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Inclusive production of b jets in collisions of p–Pb and pp in ALICE

Beauty quarks are produced mostly in initial hard scattering processes and their production rate can be calculated using perturbative quantum chromodynamics (pQCD). Thanks to excellent particle tracking capabilities, the ALICE experiment at the CERN LHC is able to reconstruct beauty-hadron decay vertices displaced hundreds of micrometers from the primary interaction vertex. The talk will present inclusive pT spectra of b jets measured in p–Pb and pp collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV, the corresponding nuclear modification factor, and the fraction of b jets among inclusive jets. The production cross-section of b jets was measured down to 10 GeV/c, which is lower than in previous measurements of b jets done at the LHC. Low pT b-jets can be utilized to search for mass effects, which may affect parton interaction in cold and hot nuclear matter. The reported measurements provide an important reference for future measurements of b jets in Pb–Pb collisions.

The seminar will take place on Thursday, March 9, 2023 at 10:00 a.m. in the NPI meeting room (conference room).