LHC Seminar

SPEAKER: Ramona Lea

TITLE: **Production of light (anti-)nuclei and (anti-)hypernuclei with ALICE at the LHC**

DATE: 26 Sep 2017, 11:00

PLACE: 500-1-001 - Main Auditorium

ABSTRACT

The high energy pp, p-Pb, and Pb-Pb collisions at the LHC offer a unique tool to study the production of nuclei and hyperon-baryon bound systems, called hypernuclei, and the corresponding anti-particles. The study of the production yield of (anti-)(hyper-)nuclei in heay-ion collisions at the LHC energy probes the late stages in the evolution of the hot, dense nuclear matter created in the collision and serves as baseline for the search of exotic multi-baryon states.
The measurements in smaller collision systems may also provide an input to cosmological searches for segregated primordial anti-matter and dark matter, since anti-nuclei produced in pp and p--A collisions in interstellar space represent a background source in these measurements. Thanks to its excellent particle identification and tracking capabilities, the ALICE detector allows for the measurement of deuterons, tritons, 3He, 4He and their corresponding anti-nuclei. Moreover, the secondary vertices from the mesonic decays of (anti-)hypernuclei can be reconstructed.
Results on the production yields of light nuclei and anti-nuclei in pp, p–Pb, and Pb–Pb collisions will be presented, together with the measurements of hypertriton lifetime and production rates in Pb–Pb collisions. The experimental results will be compared to the predictions of statistical (thermal) model and baryon coalescence models. Further constraints on the production mechanism of light nuclei are obtained from measurements of the elliptic flow of deuterons and their comparison to expectations from coalescence and hydrodynamic models.

Organised by: M. Mangano, C. Lourenco, G. Unal.....
Refreshments will be served at 10h30