FAIR next generation scientists - 7th Edition Workshop



Contribution ID: 136

Type: not specified

Performance studies of strangeness production in central Pb-Pb collisions at sNN = 8.8 GeV with the NA60+ experiment at the CERN SPS

Friday, 27 May 2022 16:40 (20 minutes)

The NA60+ experiment is designed to study the phase diagram of strongly interacting matter by measuring thermal dimuons, charm, and strange particles produced in ultra-relativistic heavy-ion collisions. NA60+ will be installed at the CERN SPS, allowing an energy scan in the range sNN---- $\sqrt{-5}$ -17 GeV and studying a region of high baryonic density little explored so far. The apparatus will be formed by a vertex telescope and a muon spectrometer. The vertex telescope will consist of layers of large area and ultra-thin state-of-the-art Monolithic Active Pixel Sensors (MAPS), which offer excellent spatial resolution with a low material budget. The vertex telescope will allow the production of strange particles, such as ϕ , K0S, (anti-) Λ 0, Ξ ±, and Ω ± to be studied through exclusive reconstruction of hadronic decay channels. The enhancement of strangeness production is a direct probe of the quark-gluon plasma formation in ultra-relativistic heavy-ion collisions. The ϕ , Ξ ±, and Ω ± are composed respectively of ss⁻, d⁻s⁻s⁻ (dss), and s⁻s⁻s⁻ (sss) quarks. Therefore, they are ideal probes to study strangeness production. Moreover, previous measurements of ϕ production performed by the NA49 and NA50 experiments at the SPS, respectively in the K+K- and $\mu+\mu-$ decay channels, showed a large discrepancy. NA60+ could measure both decay channels, shedding light on this puzzle. The K0S and (anti-)A0 are also a probe for the study of strangeness production. Since they are more abundantly produced in Pb-Pb collisions compared to other hyperons, they can also be used to test the baryon production models by measuring their yield ratios. In this talk, I will present the expected performances for the measurement of the ϕ , K0S, (anti-) Λ 0, Ξ ±, and Ω ± production in central Pb-Pb collisions at sNN---- $\sqrt{=8.8}$ GeV, using the vertex spectrometer to reconstruct their hadronic decays respectively into K+K-, π+π-, pπ- + c.c., Λ0(pπ-)π-+ c.c, and $\Lambda 0(p\pi -)K - + c.c.$

Presenter: ALOCCO, Giacomo (University & INFN of Cagliari)