



Contribution ID: 312

Type: Oral Presentation

Review of strangeness and dilepton production in elementary collisions at HADES

The HADES (High-Acceptance Di-Electron Spectrometer) detector is a versatile device operating at SIS18 synchrotron at GSI Darmstadt with a vital list of results in the elementary and heavy ion collisions. It combines unique capability of dileptons and hadrons identification. HADES provides a unique platform for investigating elementary reactions, with a particular focus on the strangeness and dilepton production channels. These reactions offer critical insights into the dynamics of hadronic and nuclear matter, hadron structure in non-perturbative QCD regime, as well as the searches for new particles like axions in rare meson decays. The strangeness program at HADES explores the production of strange hadrons in proton-proton, proton-nucleus, and pion-nucleus collisions, serving as a sensitive probe of the underlying production mechanisms and structures. With the recent experiment at 4.5 GeV beam kinetic energy, we enabled more precise studies of heavier mass hyperons like $\Sigma(1385)$, $\Lambda(1405)$ and $\Lambda(1520)$, and double-strangeness like $\Xi(1320)$ particles, and various mesons like omega, eta. Dilepton production serves as a powerful tool to investigate in-medium modifications of hadrons and provides key information on the properties of hot and dense matter, especially in the context of the early stages of hadronic reactions. Thus, the results from dilepton production in the elementary reactions are vital for the current and future heavy ion collisions at SIS100. Dilepton production with pion and proton induced reactions on proton targets in HADES provides unique possibility to study electromagnetic structure of baryons, with the measurements of the electromagnetic transition form factors in the first and second resonance region. This talk will present recent results from proton and pion induced elementary collisions from the HADES collaboration, emphasizing the importance of these studies in advancing our understanding of the strong force, hadron structure, and the production mechanisms in various particle collision processes.

Author: LALIK, Rafał (Jagiellonian University in Kraków, Poland)

Presenter: LALIK, Rafał (Jagiellonian University in Kraków, Poland)

Session Classification: Parallel session

Track Classification: Hadron Structure, Spectroscopy and Dynamics