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Production and Dalitz decays of baryon resonances in proton-proton interaction at $\sqrt{s} = 3.16$ GeV with HADES

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One of the main physics goals of HADES is to investigate spectral modifications of light vector mesons in strongly interacting matter via their dilepton (e^+e^-) decay channel. Theoretical models predict such modifications due to strong meson-baryon resonance coupling which can be also probed in elementary collisions. In 2007 electron-positron pair production has been measured in $p+p$ reactions with beam kinetic energy of 3.5 GeV. One of the basic observables in this measurement is inclusive e^+e^- mass distribution. The expected e^+e^- production channels are given by Dalitz decays of π^0 , η , ω mesons and $\Delta(1232)$ resonance.

Indeed, the experimental data can be described by simulation of the aforementioned components, everywhere but not in the mass region below vector meson pole ($M_{inv} \in (0.5 - 0.7)$). We present analysis results of the exclusive channels $pp\pi^0$, $pn\pi^+$, ppe^+e^- , which might indicate contributions of higher lying resonances. In order to estimate production cross sections of the baryonic resonances for hadronic channels, the results have been compared to Monte-Carlo calculations based on the resonance model assuming incoherent sum of various four stars resonances. To convert obtained resonances cross sections into e^+e^- yield, two models of $d\Gamma(R \rightarrow pe^+e^-)/dM(e^+e^-)$ are applied in the simulation.

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