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 ($M_{inv}^{e^+e^-} \in (0.5-0.7)$) ([1]).

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 [2] assuming incoherent sum of various four stars resonances. To convert obtained resonances cross sections into e^+e^- yield, two models of $\frac{\Gamma_{R\to pe^+e^-}}{dM_{e^+e^-}}$ of ([3], [4]) are applied in the simulation.

[1] A. Rustamov et al. , arXiv:1112.3607v1 [nucl-ex].

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