



Contribution ID: 258

Type: Parallel Talk

Study of the $e^+e^- \rightarrow$ hadrons reactions with CMD-3 detector at VEPP-2000 collider

Saturday, 8 July 2017 09:15 (15 minutes)

The CMD-3 detector is taking data at the VEPP-2000 e^+e^- collider (BINP, Novosibirsk, Russia). The CMD-3 is the general purpose particle magnetic (1.3 T) detector, equipped with the tracking system, two crystal (CSI and BGO) calorimeters, liquid Xe calorimeter, TOF and muon systems. The main goal of experiments with CMD-3 is the measurement of the cross-sections and dynamics of the exclusive modes of $e^+e^- \rightarrow$ hadrons reactions. In particular, these results provide important input for the calculation of the hadronic contribution to the muons anomalous magnetic moment. First round of data taking with the CMD-3 detector at the VEPP-2000 e^+e^- collider was performed in 2011-2013 with about 60 $1/\text{pb}$ integrated luminosity in the energy range from 0.32 to 2.0 GeV in c.m. Amount of collected data exceeds all previous experiments. The beam energy was continuously measured concurrently with the data taking using a Compton backscattering system.

Here we present the survey of new and published analysis results, including precise measurement of $e^+e^- \rightarrow \pi^+\pi^-$ reaction, as well as other hadron final states with up to six pions or states include two kaons.

At the end of 2016 the VEPP-2000 collider resumed operations after upgrade of the injection system, and a performance close to the project luminosity of $10^{32} \text{ cm}^{-2}\text{s}^{-1}$ at 2 GeV has been demonstrated. First preliminary results of new 2017 run are also presented.

Experimental Collaboration

CMD3-Collaboration

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Session Classification: QCD and hadronic physics

Track Classification: QCD and Hadronic Physics