INTRODUCTION

The physics program of the VEPP-2000 project includes the high-precision measurement of the inclusive $e^+e^-$ to hadrons cross-section in the low energy limit, a calculation of the hadronic contribution to the muon anomalous magnetic moment ($g-2$), in the frame of the Standard Model and verification of the Vector Meson Dominance Theory. The final states with two $K$-mesons and one $\pi^0$-meson have $12\%$ contribution into the hadronic cross-section. In this study we obtain the preliminary results about the measurement of $33\pm1$ pb$^{-1}$ obtained in 2011 and 2012 seasons in the energy range from 1.1 GeV to 2 GeV.

VEPP-2000

The VEPP-2000 is an electron-positron collider at Budker Institute of Nuclear Physics, Novosibirsk, Russia [1]. A distinctive feature is the use of the concept the circular section of the beam which increases the collider luminosity up to $1 \times 10^{33} \text{cm}^{-2}\text{s}^{-1}$ (project). The measurement of the integral luminosity is based on the determination of the event number of processes $e^+e^-\rightarrow e^+e^-$, $e^+e^-\rightarrow \gamma\gamma$.

CMD-3

Cryogenic magnetic detector [2]
- DC — drift chamber
- ZC — z-chamber
- LXe — liquid xenon calorimeter
- Cal — calorimeter
- TOF — time-of-flight system
- Mu — muon system
- BGO — calorimeter

The Monte Carlo simulation is used to determine the detection efficiency after the applying of the selection criteria. In the analysis we used $10^3$ events for every energy point taking into account the peculiarities of the season.

BACKGROUND PROCESSES

According to the results of MHG2000 Generator

NUMBER OF EVENTS

We determine the number of events with $\pi^0$ by fit of the invariant mass of two photons in the signal and sideband ranges. Then we obtain the number of events by the next expression:

$$N_\text{out} = N_\text{signal} \times \alpha \epsilon$$

Where $\alpha \approx 0.23$ — ratio between number of background events in the sideband and signal ranges which are evaluated by fitting of substrate of the invariant mass of two tracks.

CROSS SECTION

$$\frac{d\sigma}{dy}(\text{proc}) = a + \frac{b}{s}$$

$$a = 2047.2, \quad b = 2.3 \times 10^5$$

FINAL EFFICIENCY

CONCLUSION AND OUTLOOK

- The preliminary results of 2011 and 2012 seasons are obtained
- To obtain preliminary results in new seasons in the nearest future
- To study of systematic uncertainties and radiation corrections

REFERENCES