

Referee's Report

The paper concerns the measurement of the $e^+ e^-$ annihilation into hadrons within the Φ -meson energy range (984-1060 MeV) using the Cryogenic Magnetic Detector (CMD-2) on the $e^+ e^-$ collider of the Budker Institute of Nuclear Physics of Novosibirsk (VEPP-2M).

The studied process is $e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$. The collected information refers to 11 pb^{-1} of integrated luminosity. All 3π events have been fully reconstructed. The detection efficiency was obtained using a large MC sample of events at the Φ energy. Corrections to the efficiency were introduced by using partially reconstructed events.

From the measured 3π mass spectrum the product of the branching fractions $B(\phi \rightarrow e^+ e^-) \times B(\phi \rightarrow \pi^+ \pi^- \pi^0)$ and the $\sigma(e^+ e^- \rightarrow \pi^+ \pi^- \pi^0)$ cross section were evaluated. The mass and the width of the ϕ -meson and the Φ - ω mixing angle turned out in agreement with the world average values. The $\sigma_{3\pi}$ cross section turned out in good agreement with the values found recently by BABAR and by the Spherical Neutral Detector (SND).

The product of branching fractions is in good agreement with the BABAR value with a better total accuracy, due, in particular, to a careful study of systematic uncertainties.

The interest of the paper lies in these new precision results, despite decades of experiments in the field. A special attention was also deserved in the paper to the analysis of the dynamics of the $\Phi \rightarrow \pi^+ \pi^- \pi^0$ decay, identifying the $\rho\pi$ dominance and as well a small $\Phi \rightarrow 3\pi$ contribution.

The paper is well structured and has contents worthy to be published in Physics Letters B.