

Meson production in $\gamma\gamma$ interactions at DAΦNE

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26 aprile 2011

Mesons coupling to two photons provides information on the structure of these particles, and can be measured in reactions such as $e^+e^- \rightarrow e^+e^-\gamma^*\gamma^* \rightarrow e^+e^-X$. Two processes have been studied with KLOE experiment at DAΦNE ϕ -factory, the production $\gamma^*\gamma^* \rightarrow \eta$ and $\gamma^*\gamma^* \rightarrow \pi^0\pi^0$. The analysis is done using a $\mathcal{L} \simeq 240 \text{ pb}^{-1}$ data sample taken at $\sqrt{s} = 1$ GeV, where background due to ϕ decays is sensibly reduced. Measurements have been done in no-tagging mode, with no detection of e^+e^- in the final state. The $e^+e^- \rightarrow e^+e^-\pi^0\pi^0$ reaction has been studied and an excess of events has been found in the four photons invariant mass region where a contribution from the isosinglet scalar meson (the 0^{++} σ meson) is expected. Evidence for the process $\gamma^*\gamma^* \rightarrow \eta$, with $\eta \rightarrow \pi^0\pi^0\pi^0$ has been observed, and a fit to the missing mass distribution has been performed obtaining a value for the cross section of $e^+e^- \rightarrow \eta\gamma$ in agreement with previous results.

These analyses show the possibility for measurements of $\gamma\gamma$ interactions at DAΦNE, in view of the forthcoming KLOE-2 experiment. The detector has been equipped with small angle taggers to measure electron and/or positron momentum in the final state.