

Latest results from KLOE/KLOE-2

Wednesday, 18 October 2023 09:30 (30 minutes)

KLOE and KLOE-2 collected the largest dataset (about 8 fb^{-1}) at an electron-positron collider operating at the peak of the $\phi(1020)$ resonance, corresponding to the production of about 24 billions of ϕ mesons, namely 8 billion pairs of neutral K mesons and 300 millions of η mesons. A wide hadron physics program, investigating fundamental symmetries, rare meson decays, and dark forces is carried on by the KLOE-2 Collaboration.

The entanglement in the neutral kaon pairs produced at the DAΦNE ϕ -factory is a unique tool to test discrete symmetries. The final result of the first direct test of CPT and T in neutral kaon transitions is presented.

The $\eta \rightarrow \pi^0 \gamma \gamma$ decay is a test bench for various models and effective theories, like VMD (Vector Meson Dominance) or ChPT (Chiral Perturbation Theory). KLOE-2 performed a new precise measurement of the branching ratio, by using its highly pure η sample produced in $\phi \rightarrow \eta \gamma$ process.

KLOE-2 is currently probing a complementary model to the U boson or “dark photon”, where the dark force mediator is a hypothetical leptophobic B -boson that could show up in the $\phi \rightarrow \eta B \rightarrow \eta \pi^0 \gamma$ channel. The preliminary upper limit on the coupling constant of such a particle to ordinary matter will be shown.

The KLOE-2 High Energy Tagger detectors allow the possibility to investigate the single π^0 production in $\gamma \gamma$ collisions by tagging the scattered electrons from $e^+ e^- \rightarrow e^+ e^- \gamma^* \gamma^* \rightarrow e^+ e^- \pi^0$ in coincidence with the π^0 in the barrel calorimeter. A preliminary measurement of the $\gamma^* \gamma^* \rightarrow \pi^0$ counting obtained by using single tagged events will be reported.

Parallel Session

Invited Plenary Talk

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Session Classification: Plenary talk