

Results and perspectives on hadron physics at KLOE/KLOE-2

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The KLOE-2 data-taking at the e+e- DAPHNE collider in Frascati has been completed by achieving an integrated luminosity of more than 5 fb-1 at the phi peak. KLOE-2 is an updated version of KLOE experiment with new detectors and an extended physics program, including light mesons investigations at unprecedented statistics. The KLOE/KLOE-2 data sample corresponds to more than 3×10^8 eta meson events. The huge available statistics has been used to search for the P, CP violating decay $\eta \rightarrow \pi^+\pi^-$, obtaining the most stringent upper limit for this decay by using 1.7 fb-1 of KLOE data. Perspective with the whole KLOE-2/KLOE data will be also discussed.

The $\eta \rightarrow \pi^0 \gamma \gamma$ gamma decay is an important test of ChPT because of its sensitivity to the p^6 term on both the branching ratio and the $M(\gamma\gamma)$ spectrum. A preliminary BR KLOE measurement, based on 450 pb-1, provided a 4 sigma's lower value w.r.t. the most accurate determination from Crystal Ball. A new analysis with a larger data sample is in progress and confirm this result. The same five photon final state could be used to look for the B boson, a postulated leptophobic mediator of dark forces; the status of this investigation will be presented.

Scintillator hodoscopes installed by means of roman pots in the DAPHNE beam pipe allow to investigate gamma-gamma physics at the phi resonance from the reaction $e^+e^- \rightarrow e^+e^-\gamma\gamma \rightarrow e^+e^-X$ by tagging final state leptons. Single pseudoscalar production provides the determination of the two-photon decay widths of these mesons. The analysis for the π^0 final state is in progress, aiming to achieve an accuracy of O(1%). The π^0 production from two-photon fusion is tagged by requiring the coincidence between the HET detector and the KLOE calorimeter when two-cluster bunches are reconstructed, and evaluating the uncorrelated HET-KLOE time coincidences. Data stability studies, based on very low angle Bhabha cross section measurement, and updates on $gg \rightarrow \pi^0$ search will be presented.

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Presenter: DE LEO, Veronica (INFN - National Institute for Nuclear Physics)

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