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Precision measurements of the $\pi\pi\gamma$ and $\mu\mu\gamma$ cross sections with the KLOE detector

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Measurements of the muon magnetic anomaly performed at the BNL have reached an accuracy of 0.54 ppm and the final result differs from Standard Model estimates by 3.2-3.6 standard deviations. The main uncertainty on the theoretical evaluation is due to hadronic loop contributions which are not calculable in perturbative QCD and are obtained from a dispersion integral over the hadronic cross section at low energy. The KLOE experiment at the DAFNE phi-factory in Frascati was the first to exploit Initial State Radiation (ISR) processes for precision measurements of the hadronic cross section below 1 GeV, that accounts for most (70%) of the hadronic contribution to the muon anomaly. In 2005 and 2008 the KLOE collaboration has published two measurements of the $\pi\pi\gamma$ cross section with the ISR photon at small angle, and an independent measurement with the photon emitted at large angle was published in 2011. Recently, a new analysis of KLOE data has been performed which derives the pion form factor directly from the bin-by-bin ratio of $\pi\pi\gamma$ to $\mu\mu\gamma$ cross sections. We present the final results and the comparison with our previous measurements.

High-luminosity e^+e^- colliders at the GeV scale have been recognized to be ideal environment to search for the U-boson in the Dark Force sector (dark photon). Preliminary results of the U-boson search in the $\mu\mu\gamma$ sample with the exclusion plot in the mass range from 600-1000 MeV are presented.

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Classification de thématique: Experiment