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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 Session: BSM & Electroweak results

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