

# Hadron Physics at KLOE and KLOE-2

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The KLOE experiment has collected 2.5 fb<sup>-1</sup> at the peak of the phi resonance at the e<sup>+</sup>e<sup>-</sup> collider DAPHNE in Frascati. The whole data set includes 100 million eta's produced through the radiative decay phi -> eta gamma and tagged by means of the monochromatic recoil photon. Measurements of eta decay channels, such as pi<sup>+</sup> pi<sup>-</sup> gamma, are in progress. We have also measured the branching ratio of the eta -> e<sup>+</sup> e<sup>-</sup> decay channel, never observed before, with a sample of about 360 events.

Pseudoscalar production at the phi-factory associated to internal conversion of the photon into a lepton pair allows the measurement of the form factor  $F(q_1^2=M(\text{phi})^2, q_2^2>0)$  of pseudoscalar mesons in the kinematical region of interest for the VMD model. The only existing data on phi -> eta e<sup>+</sup> e<sup>-</sup> are based on 213 events. At KLOE, a preliminary study of this decay has been performed on 739 pb<sup>-1</sup> using the eta->pi<sup>+</sup>pi<sup>-</sup>pi<sup>0</sup> final state. Simple analysis cuts provide about 7000 signal events with very small residual background contamination.

From a sample of 240 pb<sup>-1</sup> taken off the phi resonance, a preliminary analysis of the e<sup>+</sup> e<sup>-</sup> -> e<sup>+</sup> e<sup>-</sup> eta process, without tagging e<sup>+</sup>e<sup>-</sup> in the final state is presented. Using two different decay channels, eta -> pi<sup>+</sup> pi<sup>-</sup> pi<sup>0</sup> and eta -> pi<sup>0</sup> pi<sup>0</sup> pi<sup>0</sup>, the cross section of the process e<sup>+</sup> e<sup>-</sup> -> e<sup>+</sup> e<sup>-</sup> eta is extracted. The same data set has been used to search for the f<sub>0</sub>(600) that can be produced in gamma-gamma interactions and observed in the reaction e<sup>+</sup> e<sup>-</sup> -> e<sup>+</sup> e<sup>-</sup> pi<sup>0</sup> pi<sup>0</sup>. The preliminary pi<sup>0</sup>pi<sup>0</sup> mass spectrum show an excess of events with respect to the expected background in the f<sub>0</sub>(600) mass region.

A new beam crossing scheme allowing for a reduced beam size and increased luminosity is operating at DAPHNE. The KLOE-2 detector is successfully rolled in this new interaction region and is ready to acquire collision data. At the moment, the detector is being upgraded with small angle tagging devices, to detect both high and low e<sup>+</sup>e<sup>-</sup> energy in e<sup>+</sup> e<sup>-</sup> -> e<sup>+</sup> e<sup>-</sup> X events. The inner tracker and small angle calorimeters are scheduled to be installed in a subsequent step, providing wider acceptance for both charged particles and photons. The main goal of KLOE-2 is to collect an integrated luminosity of about 20 fb<sup>-1</sup> in 2-3 years in order to refine and extend the KLOE physics programme.

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