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Hadron physics studies at KLOE

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The V−>Pgamma Dalitz decays, associated to internal conversion of the photon into a lepton pair, are not well described by the Vector Meson Dominance (VMD) models, as in the case of the process omega −> pi0 mu+ mu-, measured by the NA60 collaboration. The only existing data on phi −> eta e+ e- come from the SND experiment, which has measured the Mee invariant mass distribution on the basis of 213 events. At KLOE, a detailed study of this decay has been performed using both eta−>pi+pi-pi0 and eta−>pi0pi0pi0 final states. Simple analysis cuts provide clean signal events (about 14000 and 30000, respectively), with a residual background contamination of 2-3%.
We have also studied the decay phi −> pi0 e+ e-, where no data are available on transition form factor. Dedicated analysis cuts strongly reduce the main background component of Bhabha events to ˜20%, leading to ˜4000 signal events in the whole KLOE data set.

The gamma-gamma couplings and partial widths of mesons provide information about their structure and can be measured in the e+e- −> e+e-gamma*gamma* −> e+e-X processes. The study of gamma*gamma* −> eta will be discussed. The data sample consists of an integrated luminosity of 240 pb-1 of data taken at the center of mass energy SQRT(s)=1 GeV - where backgrounds from phi decays are suppressed - without tagging of the e+e- in the final state. The measurement of the cross section for the reaction gamma*gamma* −> eta in the two decay channels eta−>pi+pi-pi0 and eta−>3pi0, with independent systematic uncertainties, together with the extraction of the eta−>gammagamma width, will be presented.

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