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Test of discrete symmetries with neutral kaons at KLOE-2

Saturday, 8 July 2017 11:00 (15 minutes)

The KLOE-2 experiment at the INFN Laboratori Nazionali di Frascati (LNF) is currently taking data at the e+e- DAFNE collider which is implementing an innovative collision scheme based on a crab-waist configuration. An integrated luminosity of 3.5 fb-1 has been already collected by KLOE-2, and at least 5 fb−1 are expected by Spring 2018.
KLOE-2 represents the continuation of KLOE with an upgraded detector and an extended physics program which includes neutral kaon interferometry and test of discrete symmetries among the main topics.

Entangled neutral kaon pairs produced at DAFNE are a unique tool to test discrete symmetries and quantum coherence at the utmost sensitivity, in particular strongly motivating the experimental searches of possible CPT violating effects, which would constitute an unambiguous signal of a New Physics framework.

The status of the latest ongoing analyses on KLOE/KLOE-2 data using the most refined analyses tools will be presented and discussed:
(i) measurement of the KS semileptonic charge asymmetry and tests of CP and CPT symmetry,
(ii) test of Time reversal and CPT in transitions in Phi->KSKL->pienu,3pi0,(2pi) decays,
(iii) search for the CP violating KS->3pi0 decay.

Experimental Collaboration

KLOE-2

Primary author: DI DOMENICO, Antonio (Sapienza Universita e INFN, Roma I (IT))

Presenter: DI DOMENICO, Antonio (Sapienza Universita e INFN, Roma I (IT))

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