LHC Project Note 192
CERN-THESIS-99-006

1999-06-22

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Fault Detection on the LHC Beam Dump Kicker System

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Keywords: Fault detection, LHC Beam dump

Summary

This report describes a proposal for fault detection on the LHC beam dump kicker system. As a result of a fault analysis two fault detection modules are proposed; A off-line test and a continuous surveillance. The fault detection, needing continues data, and the requirements to the data acquisition is given special attention. The off-line test declares the system, including stand-by components, fault free prior to beam injection. The test comprises parameter estimation using the sensitivity approach requiring an ADC with better than 7 bit precision and a sampling frequency above 133kHz. The continuous surveillance comprises a model based fault detection method, based on analytical redundancy. The system requirements are a 14 bit DAC and an 16 bit ADC with a sample frequency above 1.54Hz.

Access to fulltext document:

http://preprints.cern.ch/archive/electronic/cern/preprints/thesis/thesis-99-006.pdf

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http://weblib.cern.ch/cgi-bin/showfull?uid=1731551_15544&base=CERCER&sysnb=0313943