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Experience in rad hard tests of LBDS

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LHC beam dumping system (LBDS) employs altogether 800 HV GTO like thyristors and 480 HV triggering IGBTs. It delivers up to 1 million amperes to 30 extraction and 20 dilution magnets in order to safely deposit both 7 TeV beams on their respective dump blocks. Because of crucial importance of reliable operation of LBDS for LHC safety, various failure mode were investigated, one of them being Single Event Burnout (SEB) of HV semiconductors used. In house developed method for non-destructive measurement of SEB cross-section was used for measurement of this parameter for all HV semiconductors used and mitigations were applied where necessary. Based on these measurements the probability of SEB related failure rate of LBDS was evaluated.

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