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Technical Report on the Beam Induced Backgrounds in the H1 Detector

H1 background working group

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Abstract

This report describes studies of the beam induced backgrounds that presently prevent operation of the H1 detector with the design HERA II beam currents. Measurements are presented and compared with Monte Carlo simulations that provide a reasonable description of the backgrounds in H1 arising from synchrotron radiation and proton beam-gas interactions. A detailed evaluation is given of various measures that reduce these backgrounds. Significant improvements require a substantially better vacuum in the region around the H1 interaction region, extending to at least $z \simeq -12\,\mathrm{m}$.