

Beam-gas Interactions in the Beam Delivery System

L. KELLER, T. MARUYAMA and T. MARKIEWICZ
(Stanford Linear Accelerator Center)

ILC-NOTE-2007-016

<http://ilcdoc.linearcollider.org>

Conclusions

1. At 10 nTorr within the IP region there are 0.02–0.04 hits/bunch (3-6 hits TPC) at an average energy of about 100 GeV/hit originating inside 200 m from the IP. Some of these cause intolerable background in the vertex detector, so to reduce this background to less than 1% per bunch crossing, the pressure specification inside 200 m from the IP is 1 nTorr.
2. At 10 nTorr, on the FD protection collimator 13 m from the IP, there are 0.21 charged hits (33 hits TPC) at an average charged energy of about 240 GeV/hit and 0.06 photon hits/bunch (9 hits TPC) at an average photon energy of about 50 GeV/hit originating inside 800 m from the IP. This leads to a conservative pressure specification of 10 nTorr in the BDS from 200 to 800 m.
3. From a particle background standpoint, within the IP region between the QD0 quadrupoles, the pressure can be greater than 1 nTorr since luminosity backgrounds will be dominant in this region.

160 bunches

