Results from TCP.D6L7 Test on 25-10-2010

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Overview of this Talk

TCP Test Procedure and overview of beam dump

BLM Losses vs Dcum (RS05) as example

Intensity and Jaw Position during test

BLM and vacuum losses versus time

BLM losses versus jaw position

Vacuum Losses versus jaw position

BLM and Vacuum Losses versus Jaw Position

TCP BLM Maximum Losses for all RS during test

BLM Post Mortem Expert Data for TCPs and TCSGs in IR7
- Increment every 3 sec jaw position by 5 μm
- TCP position thresholds were not changed for maximum safety.
- Got tail data for beam1 vertical from 2.045mm to 1.642mm (explored 1 sigma of tail).
Beam Dump during of TCP Test at 3.5TeV

- Beam 1 intensity: 42.62e12p, Beam 2 intensity: 39.75e12p, beta* = 3.4m
- Beams dumped at 14:07:49 (LT): 25-10-2010
- Beams dumped due to losses on 04L6 MQY (B2I20, B1E20) and 06R6 MQY (B2I20, B1E20) in RS01- RS05, not due to losses on TCP monitors
- Stepwise movement of collimator jaw during 4 minutes causes losses.
In many BLMs with a max. loss of 0.1 Gy/sec for RS05 (2.56ms)
Stepwise movement of collimator jaw (every 3 sec 5µm) during ~4 minutes leads to decrease in beam intensity.
BLM and Vacuum (77-B) Losses versus Time

- BLMEI.07L7.B1E10_TCP.D6L7.B1 located at 19790.184 m
- VGPB 77 6L7 located at 19841.942 m
- Distance monitor- pressure gauge is 51.758 m
BLM and Vacuum (77-R) Losses versus Time


- BLMEI.07L7.B1E10_TCP.D6L7.B1 located at 19790.184 m
- VGPB 77 6L7 located at 19841.942 m
- Distance monitor- pressure gauge is 51.758 m
- BLM Losses on BLMEI.07L7.B1E10_TCP.D6L7.B1 for RS09 vs jaw position show a maximum loss every 0.005 and 0.01 mm during stepwise movement of collimator jaw
- BLM Losses on BLMEI.07L7.B1E10_TCP.D6L7.B1 for RS09 vs jaw position show a maximum loss every 0.01 mm during stepwise Movement of collimator jaw.
- **Vacuum losses vs jaw position**
- **Max. increase in pressure from 5e-10 mbar up to 2.1e-8 mbar**
- Vacuum losses vs jaw position
- Max. increase in pressure from 5e-10 mbar up to 2.1e-8 mbar
Vacuum and BLM Losses versus Jaw Position

- BLM Losses on BLMEI.07L7.B1E10_TCP.D6L7.B1 for RS09 and vacuum losses vs jaw position in mm during stepwise movement of collimator jaw
- Each curve represents loss pattern over time for a max loss during TCP jaw movement (RS01-RS05) constant, then decrease until RS09
- Losses from long PM buffer on TCPs in L7 and R7 for RS01 vs time
- Losses appear with a frequency of ~0.2sec during the 1.7sec before dump
BLM Post Mortem Expert Data for TCPs in 7 (Zoom)

- Losses from long PM buffer on TCPs in L7 and R7 for RS01 vs time
- Zoom into losses before and during beam dump
- TCP A6L7 B1 does follow the 'oscillations' before the dump but NOT 0.04 sec before dump
- Losses from long PM buffer on TCPs in L7 and R7 for RS01 vs time
- Zoom into losses during beam dump
- Highest losses during dump at TCPs in R7 (1.2 Gy/sec)
- BLM Long PM buffer data for losses on TCSGs in L7
BLM Post Mortem Expert Data for TSGs in 7 (Zoom)

- BLM Losses on TCSGs in L7 shortly before dump occurred
- BLM and vacuum losses around collimators in IR7 have been investigated.
- During the TCP jaw movement, the vacuum losses increase from $5 \times 10^{-10}$ to $2 \times 10^{-8}$ mbar (maximum).
- BLM losses and vacuum losses correlate with jaw position.