



Updated p-p Rate Estimates for B and D decays into the VTX Endcaps

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Method

- Use p-p integrated luminosity of 176 / pb (19 weeks) from Zajc spreadsheet.
- Follow Frawley's general scheme.
- Apply factor of 0.44 for 10 cm vertex cut and factor 0.64 for run / trigger efficiency.
- → $L = 50 / \text{pb}$ useful on tape.

Yield for $D \rightarrow \mu + X$

- Use 350 μb cross section for $D\bar{D}$ pairs, 700 μb total D
- Nominal Acceptance *BR (2 arms) = $1.28 * 10^{-2}$
- Correction for actual MuTR geometry = 0.82
- MuTR and ID reconstruction efficiency of 0.96 and 0.90
- Yield for p-p, $L = 50 / \text{pb}$ is $320 * 10^6$ events !
- If single muon triggers require prescaling, reduce yield accordingly. Even a large prescale factor is acceptable.
- Rates have increased since LOI due to correction in acceptance calculation.

Yield for $B \rightarrow \mu + X$

- Use 2 ub cross section for sum of B and $B\text{bar}$
- Nominal Acceptance *BR (2 arms) = $\sim 1.1 * 10^{-2}$
(back of envelope estimate only).
- Correction for actual MuTR geometry = 0.82
- MuTR and ID reconstruction efficiency of 0.96
and 0.90
- Yield for p-p, $L = 50 / \text{pb}$ is 780K events !
- Can separate charm from beauty decays by p_T cut
on muon.

Yield for $B \rightarrow J/\psi + X \rightarrow \mu^+ \mu^-$

- Use 2 ub cross section for sum of B and Bbar
- Nominal Acceptance * BR (2 arms) = $7.8 * 10^{-5}$
- Correction for actual MuTR geometry = 0.68
- Mu tracker and ID reconstruction efficiency of 0.92 and 0.82
- 1mm vertex cut retains 39% of decays.
- Yield for p-p, $L = 50 / \text{pb}$ is 1900 events
- Rates have decreased since LOI due to lower assumed integrated luminosity.