

# *Projections from the Tevatron*

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# Outline

## $B_s$ Mixing

+ CDF and DØ → Tevatron

# *Improvements*

## Statistical power of the sample

- + add same side kaon tagger
- + add more  $B_s$  decay channels (ex.  $B_s \rightarrow D_s^- \pi^+ \pi^+ \pi^-$ )
- + gather more data

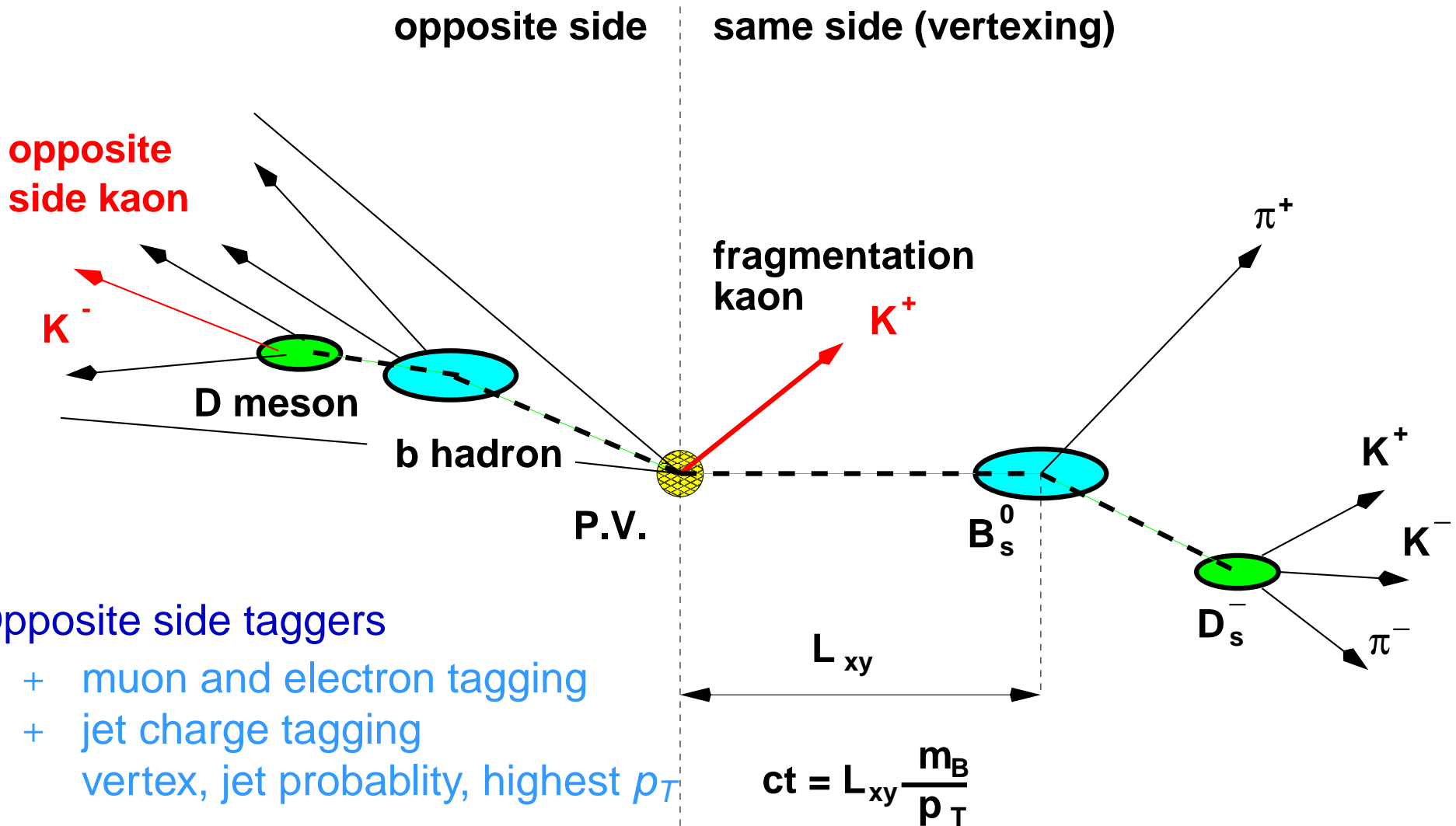
## Improve proper time resolution

- + average primary vertex  $\rightarrow$  primary vertex per candidate
- + improve reconstruction of innermost layer (Layer 00)
- + treat large silicon clusters more carefully

## For illustration of improvements

- + increase statistical power by factor of 4
- + improve  $ct$  resolution by 20%

# Tagging $B$ Production Flavor



## Opposite side taggers

- + muon and electron tagging
- + jet charge tagging
- vertex, jet probability, highest  $p_T$

## Same side tagging

- + for  $B^+$  and  $B^0$ : pion tagging
- + for  $B_s$ : kaon tagging

# Same Side Tagging



## What is difficult about SST?

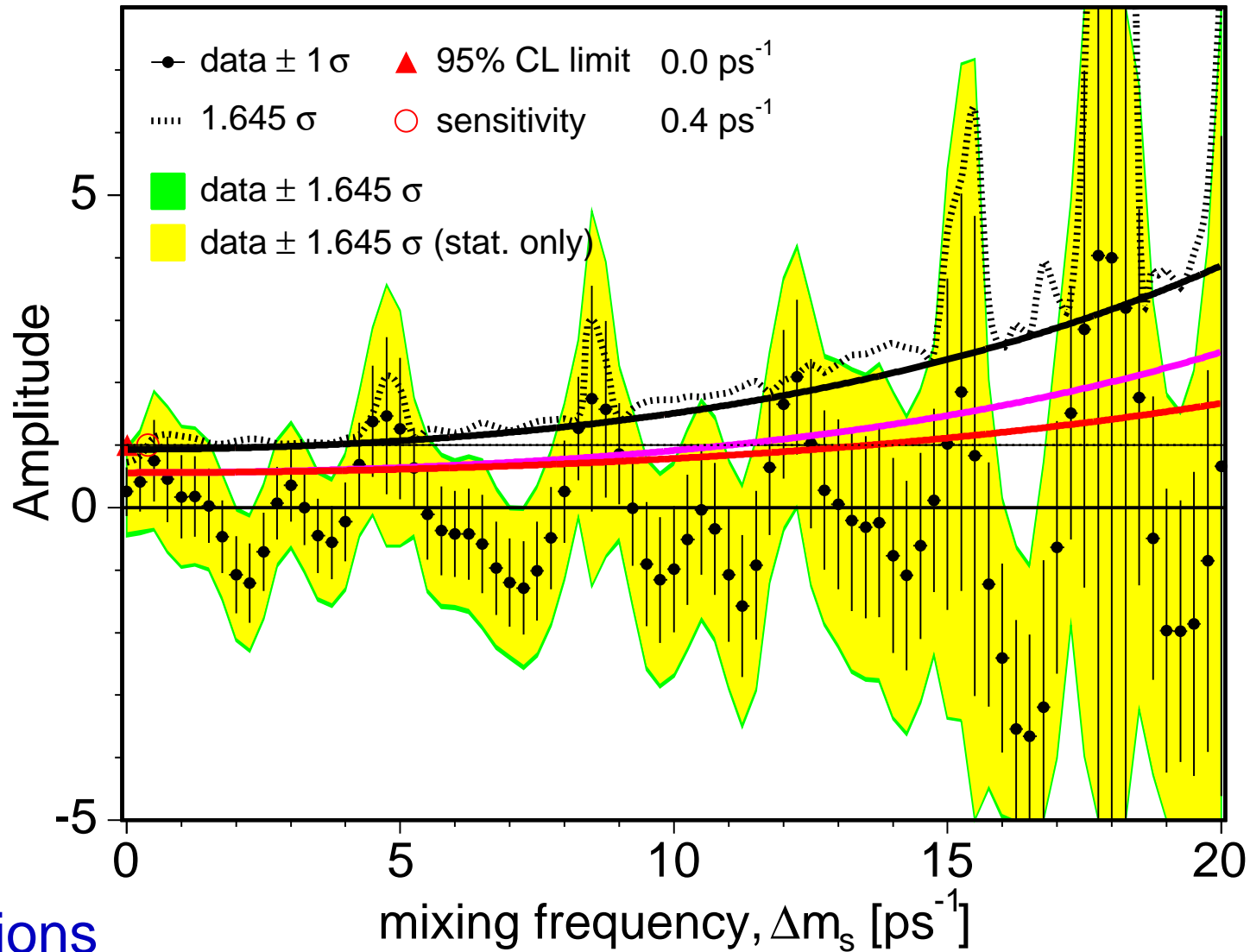
- + dilutions for  $B^+$ ,  $B^0$  and  $B_s$  are different!
- + for  $B^+$  and  $B^0$  we have  $B^{**}$  contributions
- + for  $B_s$  no  $B^{**}$  contributions
- + **cannot calibrate on data**

## Conclusion

- + we have to trust the MC (pythia) **for fragmentation**
- + kaon tagging essential to make it more reliable

# Improvements CDF: Hadronic

## Hadronic Analysis CDF II

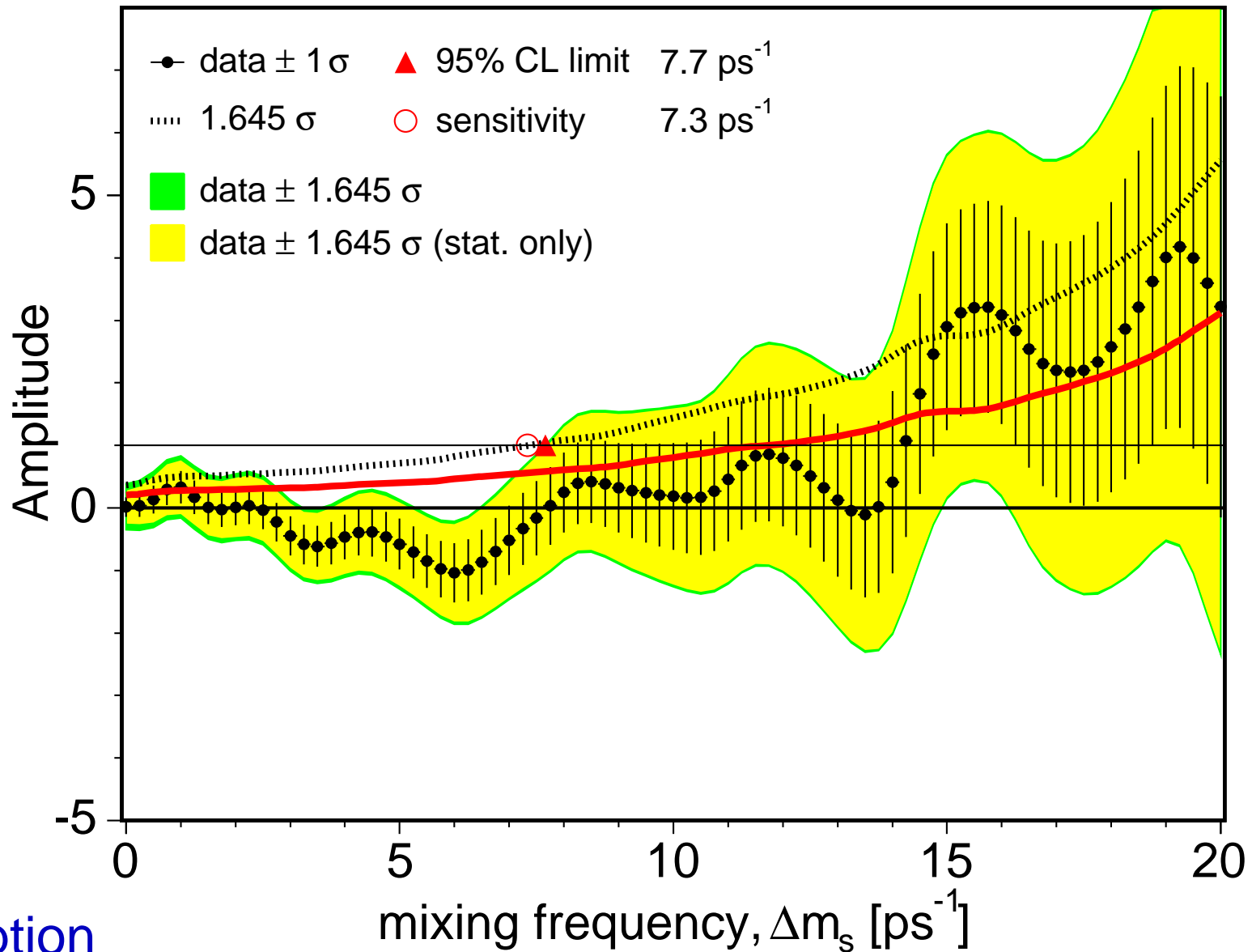


## Assumptions

- + increase statistical power by factor of 4 (new data, taggers)
- + improve  $ct$  resolution by 20% (primary vertex per candidate)

# Improvements CDF: Semileptonic

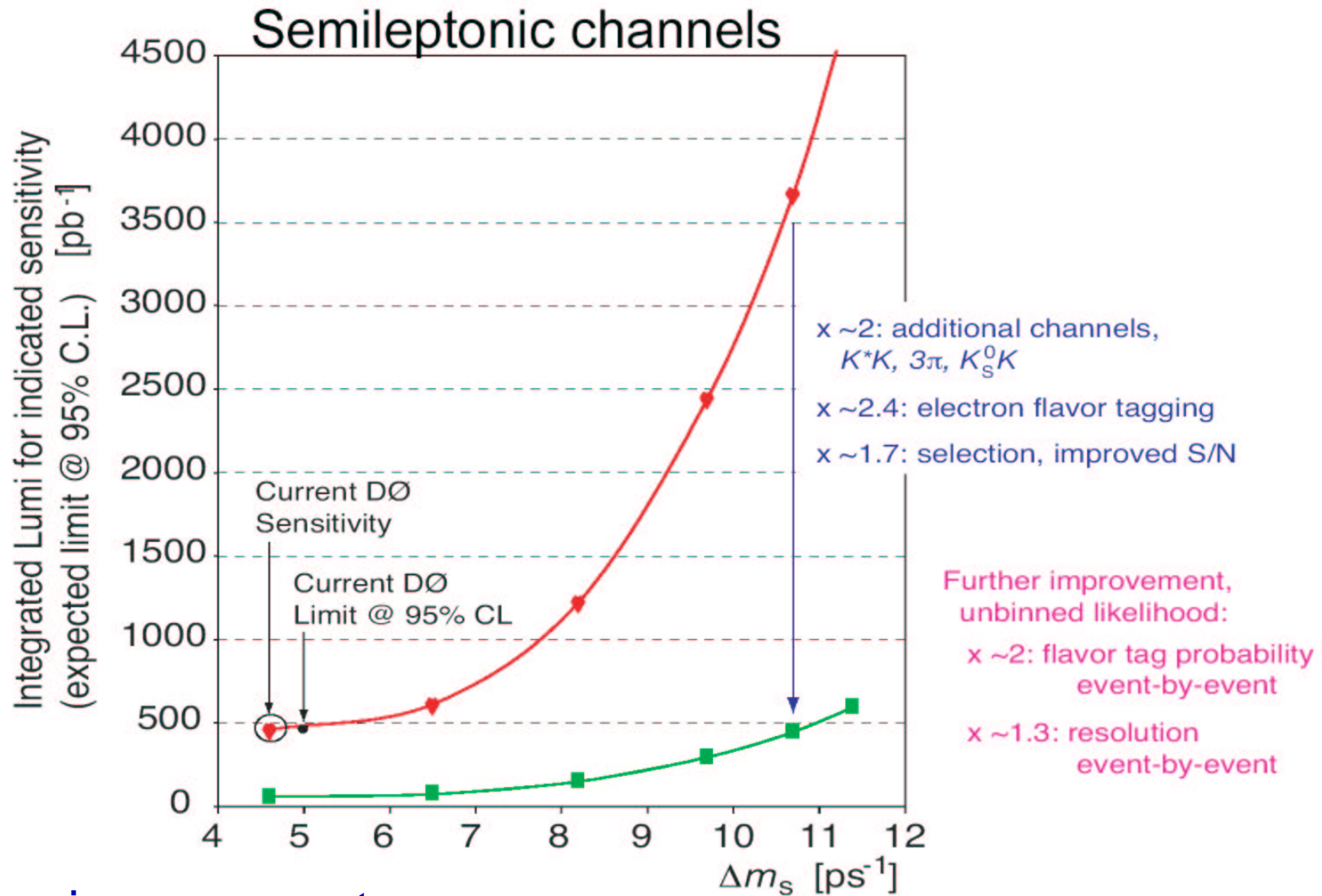
## Semileptonic Analysis CDF II



Assumption

+ increase statistical power by factor of 4 (new data, taggers)

# Improvements $D\bar{D}$ : $B_s$ Mixing Analysis



## Further improvements

- + include hadronic decays (opposite side trigger)
- + improved silicon tracker, dedicated trigger bandwidth



# Tevatron Summary for Run II

