



LHCb Reach

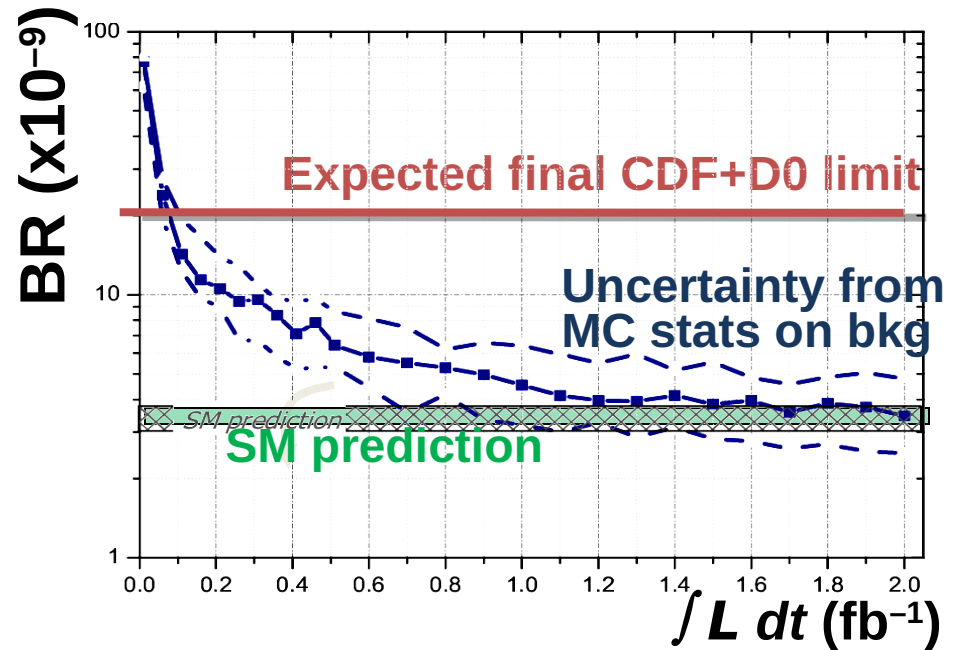
Giampiero Mancinelli
Meeting B-Physics - Ferrara
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• $B_s \rightarrow \mu^+ \mu^-$

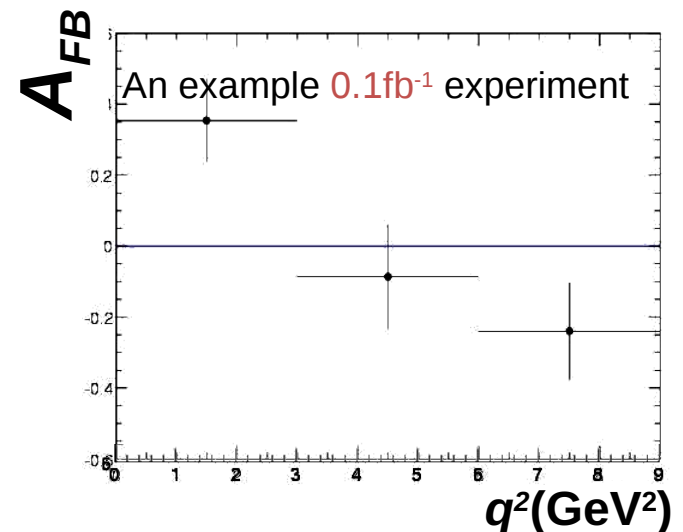
- @ 0.1 fb⁻¹ limit as D0/CDF projected combined final limit (if 8 fb⁻¹, ~20x10⁻⁹)
- @ 0.3 fb⁻¹ limit 9x10⁻⁹

90% CL limit (only bkg observed)



• $B_d \rightarrow K^* \mu^+ \mu^-$

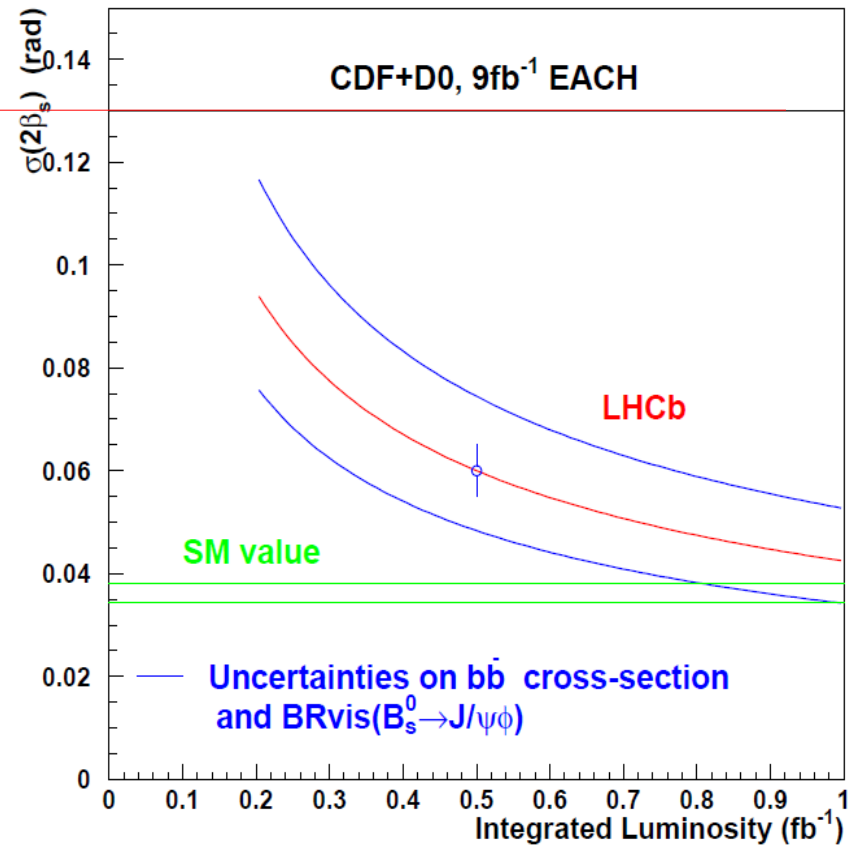
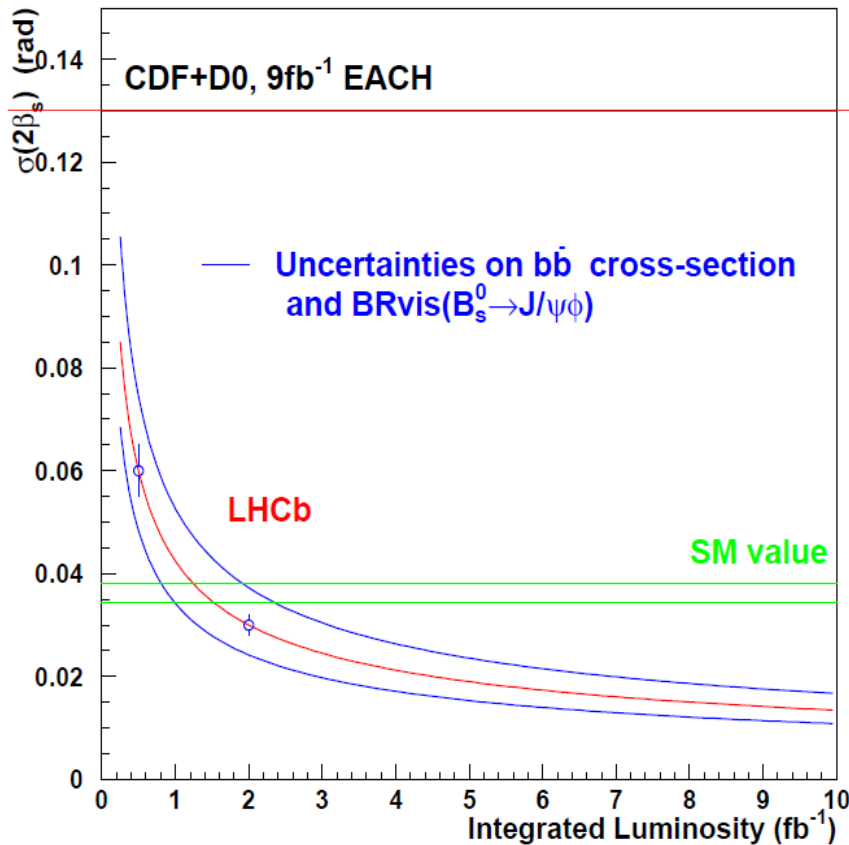
- @ 0.07 fb⁻¹ results comparable with B-factories (~1000 events @ 0.3 fb⁻¹ vs 150-200 CDF in 10 fb⁻¹)





• Φ_s

- @ 0.3 fb⁻¹ $\sigma \sim 0.08$ (D0/CDF projected combined final ~ 0.13)

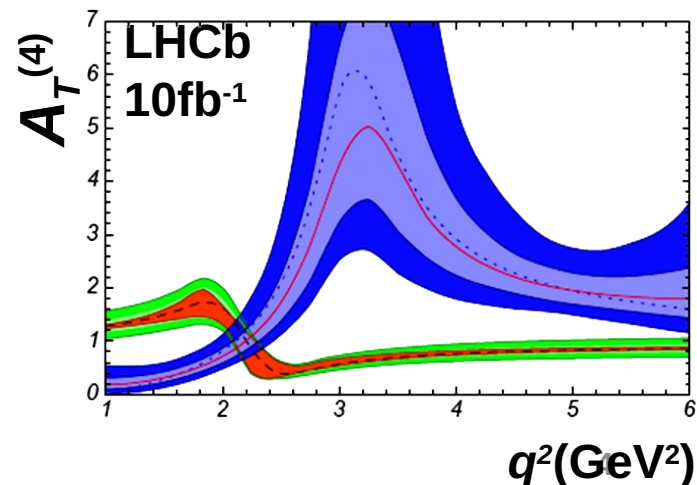
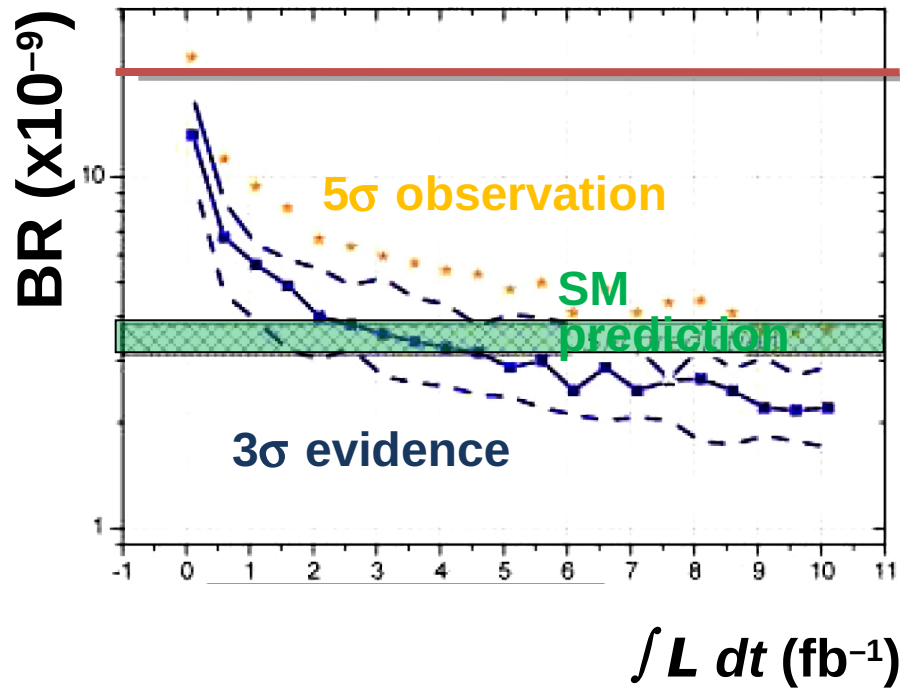


- we need data, we don't need (much...) people ;)



- $B_s \rightarrow \mu^+ \mu^-$
 - 5 σ discovery if SM ($\sigma \sim 15\%$)
- Φ_s
 - $\sigma \sim 0.009$
 - rem: CKMfitter SM 0.037 ± 0.002
- $B_d \rightarrow K^* \mu^+ \mu^-$
 - $\sigma(s_0) = 0.28$ (5%)
 - rem: SM theo err $\sim 10\%$
 - + other angular variables
- $B_s \rightarrow \phi \gamma$
 - $\sigma(A\delta) \sim 0.09$
- Angle γ
 - tree
 - 2-3 deg
 - penguins
 - 5 deg

Discovery





Sensitivities for 100 fb⁻¹

Observable	Sensitivity
$S(B_s \rightarrow \phi\phi)$	0.01 – 0.02
$S(B_d \rightarrow \phi K_S^0)$	0.025 – 0.035
$\phi_s (J/\psi\phi)$	0.003
$\sin(2\beta) (J/\psi K_S^0)$	0.003 – 0.010
$\gamma (B \rightarrow D^{(*)} K^{(*)})$	$< 1^\circ$
$\gamma (B_s \rightarrow D_s K)$	1 – 2°
$\mathcal{B}(B_s \rightarrow \mu^+ \mu^-)$	5 – 10%
$\mathcal{B}(B_d \rightarrow \mu^+ \mu^-)$	3σ
$A_T^{(2)}(B \rightarrow K^{*0} \mu^+ \mu^-)$	0.05 – 0.06
$A_{FB}(B \rightarrow K^{*0} \mu^+ \mu^-) s_0$	0.07 GeV ²
$S(B_s \rightarrow \phi\gamma)$	0.016 – 0.025
$A^{\Delta\Gamma_s}(B_s \rightarrow \phi\gamma)$	0.030 – 0.050
charm x'^2	2×10^{-5}
mixing y'	2.8×10^{-4}
CP y_{CP}	1.5×10^{-4}

Also studying Lepton Flavour Violation in $\tau \rightarrow \mu\mu\mu$