• $\sigma(t\bar{t})$ measurement and interpretation will be dominated by experimental and theoretical systematics

$\sigma(t\bar{t})$ measurement provides:

- $\Rightarrow$ test of pQCD
- $\Rightarrow$ indirect determination of m_t ($\delta m/m = 0.21\delta\sigma/\sigma$)
- $\Rightarrow$ anomalous total $t\bar{t}$ rate could be a manifestation of New Physics

$$\sigma(t\bar{t})_{\rm LHC} = 830 \pm 12\% \ \ {\rm pb}$$

• differential distributions: $p_{\rm T}(t,\ t\bar{t})$, $M(t\bar{t})$: $\Rightarrow$ new heavy resonances: Z', X^0, graviton

• at present full NLO, $\mathcal{O}(\alpha_s^3)$ calculations are available for $\sigma(t\bar{t})$ and $d\sigma/dX$

- ◇ total scale uncertainty $\Rightarrow \pm 6\%$
- ◇ uncertainty due to PDF $< 10\%$
- ◇ PDF uncertainty could be reduced significantly in the ratio, like $\sigma(t\bar{t})\ /\ \sigma(W, Z, jet, ...)$
- ◇ uncertainty due non-QCD corrections (EW, Higgs, SUSY, etc) are rather small $(1-2\%)$

• for $d\sigma/dP_T(t)$ the uncertainties are slightly larger

- ◇ scale uncertainty $\Rightarrow \pm 15\%$
- ◇ uncertainty due to PDF $< 10\%$

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