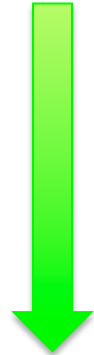

Luminosity Requirements for a 100-TeV p - p Collider

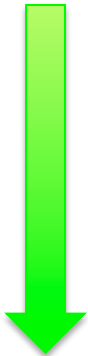
Charles Young (SLAC)

General Approach

- Physics goals



- Machine and detector parameters



- Technical and financial feasibility



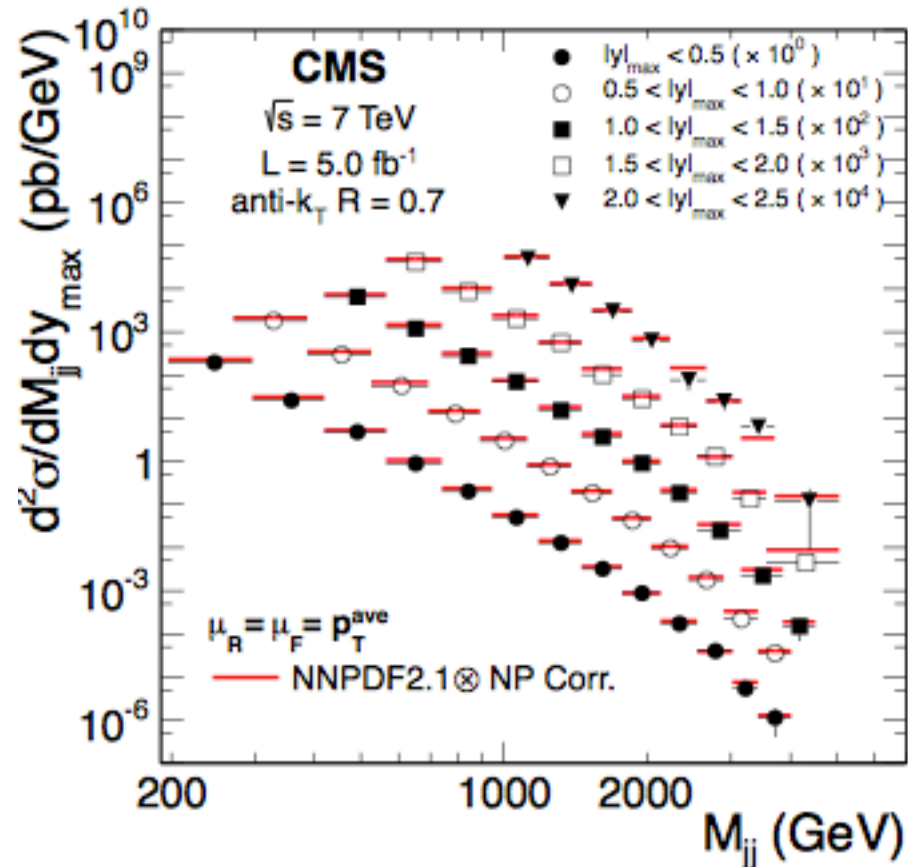
Possible but not
my approach here

Goal of this effort: Conceptual design report (CDR) and first cost estimate ready for the next Strategy Group assessment (~2018)

FCC Is a Discovery Machine

- Unknown new physics cannot provide unambiguous guidance.
- Well understood SM process that is relatively insensitive to simulation and/or analysis details as metric.
- Sufficient precision for comparison with SM at $M_{jj} \sim 0.5\sqrt{s}$ in 2 years

$$\rightarrow \mathcal{L} \sim 10^{36} \text{ cm}^{-2} \text{ sec}^{-1}$$



FCC Is a Measurement Machine

- Discover new physics in first two years.
- Make measurements of this new physics for the following two decades.

- Discover H in the first two years of LHC running.
- Measure Higgs properties for the next 20 years.

Machine feasibility and detector challenges such as pile-up – as daunting as they may be – are “details” at this stage. They are in principle amenable to solutions.

On the other hand, no amount of cleverness and hard work can help us extract physics from events that have not been produced.

$10^{36} \text{ cm}^{-2} \text{ sec}^{-1}$ or bust!