

TeV4LHC Workshop

Fermilab October 20, 2005

Single Top section of the report

- ▶ Goals of the report
- ▶ Proposed outline by Reinhard
- ▶ Discussion – Change outline
- ▶ Discussion – Get names of authors for each subsection



Goals of the report

- ▶ Not a mere collection of recent papers, results and studies
- ▶ Try to make a general useful compilation, but also put some work on common TeV/LHC sections (if work not done, maybe need more iterations)
- ▶ Identify problematic issues, hint at solutions when possible
- ▶ Relate to other sections (systematics from top mass, ...)

Proposed outline

1. Introduction (Wolfgang Wagner, Catalin Ciobano, ?)

- Brief description of what this entire section is about

2. Theoretical Overview (Scott Willenbrock, Tim Tait)

- General theory overview

3. Theoretical Studies (?)

3.1 Single top quark production mechanisms

3.2 Cross section calculations

3.3 Parton-level studies (Wolfgang Wagner, Catalin Ciobano)

4. Tevatron searches (?)

4.1 Physics goals (?)

4.2 Experimental signal signature (?)

4.3 Backgrounds (?)

4.4 Description of the current D0 analysis (AGB, Gordon Watts, Reinhard Schwienhorst)

4.5 Description of the current CDF analysis (Wolfgang Wagner, Catalin Ciobano)

4.6 Prospects for discovery and future studies and their limitations (WW,CC, ?)

4.7 Issues that need to be addressed (?)

- by theorists

- by Tevatron experiments themselves

Proposed outline (2)

5. LHC searches (Arnaud Lucotte, Florent Chevallier, Andrea Giammanco, ?)

5.1 Physics goals

5.2 Description of the current analyses

- Signal signatures, backgrounds, analysis methods, MC results

5.3 Prospects for the various analysis channels, future studies and their limitations

5.4 Issues that need to be addressed

- by theorists

- by Tevatron experiments

- by LHC experiments

6. From the Tevatron to the LHC (Arnaud Lucotte, Florent Chevallier, Reinhard Schwienhorst, ?)

6.1 Summary of commonalities between TeV and LHC (?)

- Signal signature

- TeV SM single top is similar to LHC new physics searches in the top sector

6.2 Summary of differences between TeV and LHC (?)

- low statistics search at TeV, requiring excellent signal-background separation

- high statistics precision physics at the LHC, requiring understanding of systematics

6.3 Summary of how existing TeV analyses and procedures apply to the LHC (?)

6.4 Summary of studies needed for LHC that can be done at the TeV (?)

Sections 1, 2, 3: fill in names

1. Introduction (Wolfgang Wagner, Catalin Ciobano, ?)

- Brief description of what this entire section is about

2. **3. Theoretical Studies** ((Scott Willenbrock, Tim Tait, Sullivan, Bowen, CP, Cao, Ellis, Strassler, Sasha)

3.1 General theory overview

3.2 Single top quark production mechanisms

3.3 Cross section calculations

3.4 Parton-level studies (Wolfgang Wagner, Catalin Ciobano)

Section 4: fill in names

4. Tevatron searches (Tevatron groups, Supriya, Bernd)

4.1 Physics goals **Gordon**

4.2 Experimental signal signature (?)

4.3 Backgrounds (?)

4.4 Description of the current D0 analysis (AGB, Gordon Watts, Reinhard Schwienhorst)

4.5 Description of the current CDF analysis (Wolfgang Wagner, Catalin Ciobano)

4.6 Prospects for discovery and future studies and their limitations, new physics, P5
(WW,CC, Reinhard)

4.7 Issues that need to be addressed (?)

-by theorists, experimentally

-by Tevatron experiments themselves

Section 5: fill in names

5. LHC searches (Arnaud Lucotte, Florent Chevallier, Andrea Giammanco, Sergey)

5.1 Physics goals, assuming TeV is done

5.2 Description of the current analyses

-Signal signatures, backgrounds, analysis methods, MC results

5.3 Prospects for the various analysis channels, future studies and their limitations

5.4 New physics and help from the TeV

5.5 Issues that need to be addressed

-by theorists

-by Tevatron experiments

-by LHC experiments

Section 6: fill in names

6. From the Tevatron to the LHC (Arnaud Lucotte, Florent Chevallier, Reinhard Schwienhorst, Gordon, AGB, Sergey, Andrea,)

6.1 Summary of commonalities between TeV and LHC (?)

- Signal signature

- TeV SM single top is similar to LHC new physics searches in the top sector

6.2 Summary of differences between TeV and LHC (?)

- low statistics search at TeV, requiring excellent signal-background separation

- high statistics precision physics at the LHC, requiring precise understanding of systematics

6.3 Summary of how existing TeV analyses and procedures apply to the LHC (?)

6.4 Summary of studies needed for LHC that can be done at the TeV (?)