



Contribution ID: 381

Type: **Parallel contribution**

Discriminating Top-Antitop Resonances using Azimuthal Decay Correlations

Wednesday, August 10, 2011 5:10 PM (20 minutes)

Top-antitop pairs produced in the decay of a new heavy resonance will exhibit spin correlations that contain valuable coupling information. When the tops decay, these correlations imprint themselves on the angular patterns of the final quarks and leptons. I will discuss how to probe the structure of a resonance's couplings to tops by measuring the azimuthal angles of the tops' decay products about the production axis. These angles exhibit modulations from helicity interference which are typically $O(0.1-1)$, and which by themselves allow for discrimination of spin-0 from higher spins, measurement of the CP-phase for spin-0, and measurement of the vector/axial composition for spins 1 and 2. For relativistic tops, the azimuthal decay angles can be well-approximated without detailed knowledge of the tops' velocities, and appear to be robust against imperfect energy measurements and neutrino reconstructions. I will illustrate this point in the highly challenging dileptonic decay mode, which also exhibits the largest modulations. I will comment on the relevance of these observables for testing axigluon-like models that explain the top quark A_{FB} anomaly at the Tevatron, through direct production at the LHC.

Primary authors: TWEEDIE, Brock (Boston University); BAUMGART, Matthew (Johns Hopkins)

Presenter: TWEEDIE, Brock (Boston University)

Session Classification: Top Quark Physics

Track Classification: Top Quark Physics