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# Top quark pair production: window into polarized gluon distributions

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Top-antitop pairs are produced prolifically in p+p collisions at the LHC, primarily by gluon fusion. At intermediate values of momentum fraction x for each gluon in g+g to t+tbar, the spin dependences of gluon distributions leave imprints on the momentum and spin correlations of the top pairs. These correlations are distinguishable from the quark-antiquark annihilation mechanism. Decays of such spin entangled top pairs through dilepton, single lepton and pure jet channels produce a variety of correlations among pairs of the 3-momenta of the decay products - particles and jets. These different angular correlations will be presented and related to measurable distributions of pairs of jets and/or leptons. Some models for spin dependent gluon transverse momentum distributions and generalized transverse momentum distributions will be used to simulate top pair decay product spin correlations, illustrating how to measure the gluon or quark polarizations in the colliding protons.

**Author:** Dr GOLDSTEIN, Gary (Tufts University)

**Presenter:** Dr GOLDSTEIN, Gary (Tufts University)

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