

Entanglement and Bell's Inequalities with boosted top quark pairs

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The Large Hadron Collider provides a unique environment to study quantum entanglement and violation of Bell's inequalities at the highest energy available today. In this talk, we will discuss the possible observation of these quantum correlations with top quark pair production, which represents a system of two-qubits. Our study focus on the semi-leptonic top pair channel. They indicate that the observation of entanglement is possible with the current dataset and the violation of Bell's inequalities can be probed at $3\text{-}\sigma$ level at the HL-LHC.

Author: GONÇALVES, Dorival (Oklahoma State University)

Presenter: GONÇALVES, Dorival (Oklahoma State University)

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