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Boosted top quarks at multi-TeV CLIC

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The Compact Linear Collider (CLIC) is a proposed high-luminosity linear electron-positron collider at the energy frontier. For optimal physics potential, CLIC will be operated in a staged approach, with three energy stages ranging from a few hundred GeV up to an ultimate centre-of-mass energy of 3 TeV. At the higher energy stages, a large fraction of the top quarks are produced with significant boosts resulting in a highly collimated jet environment. In this talk, we present recent results on the capability of the CLIC detector to identify highly boosted top quarks by exploiting the internal sub-structure of the final state jets. These methods play an important role in extending the top quark physics program to higher energies, which is demonstrated in a study of semi-leptonic top-quark pair production. The results presented are based on detailed Monte Carlo simulation studies including full detector simulation and relevant background processes.

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