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Title: **Framing energetic top-quark pair production at the LHC**

Abstract. Top-quark pair production is central to many facets of LHC physics. At leading order, the top and anti-top are produced in a back-to-back topology, however this topology accounts only for a minority of  $t\bar{t}$  events with TeV-scale momentum transfer. The remaining events instead involve the splitting of an initial or final-state gluon to  $t\bar{t}$ . We provide simple quantitative arguments that explain why this is the case and examine the interplay between different topologies and a range of variables that characterise the event hardness. We then develop a method to classify the topologies of individual events and use it to illustrate our findings in the context of simulated events, using both top partons and suitably defined fiducial tops. For events with large  $t\bar{t}$  invariant mass, we comment on additional features that have important experimental and theoretical implications.