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## Top quark forward-backward asymmetry and $W^{\prime}$ bosons

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### **Abstract:**

The top quark forward-backward asymmetry measured at the Fermilab Tevatron collider deviates from the standard model prediction. A  $W^{\prime}$  boson model is described, where the coupling  $W^{\prime}$ -t-d is fixed by the  $t\bar{t}$  forward-backward asymmetry and total cross section at the Tevatron. We show that such a  $W^{\prime}$  boson would be produced in association with a top quark at the CERN Large Hadron Collider (LHC), thus inducing additional  $t\bar{t}+j$  events. We use measurements of  $t\bar{t}+n$ -jet production from the LHC to constrain the allowed  $W^{\prime}$ -t-d couplings as a function of  $W^{\prime}$  boson mass. We find that this  $W^{\prime}$  model is constrained at the 95% C.L. using  $0.7 \text{ fb}^{-1}$  of data from the LHC, and could be fully excluded with  $5 \text{ fb}^{-1}$  of data.

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