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## Measurement of the top quark pair production cross section using dilepton events at 5.02 TeV

At hadron colliders, top quarks - the heaviest elementary particles known - are dominantly produced in pairs ( $t\bar{t}$ ), a production mechanism having been discovered more than twenty years ago at Tevatron, Fermilab. Although the  $t\bar{t}$  process has already entered the domain of 'precision' Physics, especially with the advent of the multi-TeV energies at the CERN Large Hadron Collider, there still remains room for dedicated experimental measurements of the top quark in the 'gap' of energies between Tevatron and LHC. Hence, the study presented here measured the total inclusive cross-section for pair production at a center-of-mass energy of 5.02 TeV having utilized a low-pileup proton-proton (pp) collision dataset whose recorded luminosity by CMS amounts to 26 pb<sup>-1</sup>. This work, has considered only leptonic W decays, the latter characterized by the presence of an energetic opposite-sign lepton pair plus missing energy. The current measurement can be used for stronger constraints to the poorly known gluon distribution (PDF) inside the proton at large longitudinal parton momentum fraction, while it paves the way for the very first observation of this elementary particle in nucleus-nucleus (AA) collisions.

### Summary

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