

XXVIII International Workshop on Deep Inelastic Scattering and Related Subjects



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Measurement of the production of two top-quark-antiquark pairs with the ATLAS detector

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The hard scattering process in which two top-quark-antiquark pairs are produced is also called four-top-quarks production and is predicted to have a small cross-section of 12 fb in the Standard Model. This very rare process has not been observed yet. The background mainly comes from top-quark-antiquark production in association with heavy flavor jets. In this presentation, two analyses are presented aiming at establishing experimental evidence for this process based on the full Run 2 dataset recorded with the ATLAS detector. The first analysis selects events with exactly one charged lepton and several jets or two charged leptons of opposite electric charge. The second analysis is based on a lepton pair with the same electric charge or events with more than two leptons. In both channels multivariate techniques are used to optimize the separation between signal and background events and enhance the sensitivity. Finally, both channels are combined.

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