

Search for tWZ production in the Full Run 2 ATLAS dataset using events with four leptons



DEPARTMENT OF
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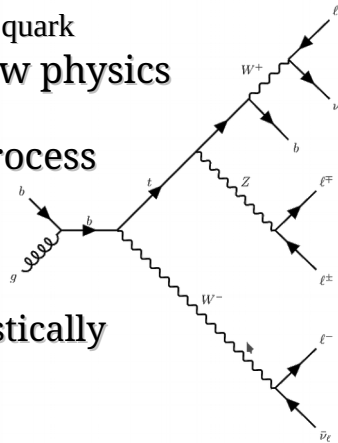
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Probing electroweak couplings to the top quark
→ sensitive to signs of new physics

Extremely low production cross section

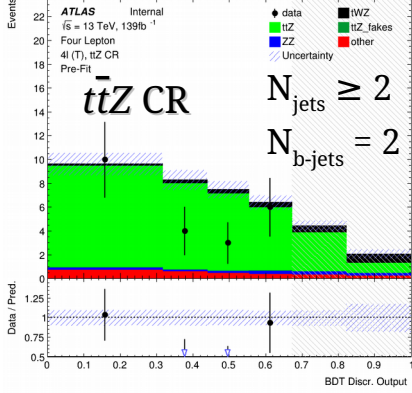
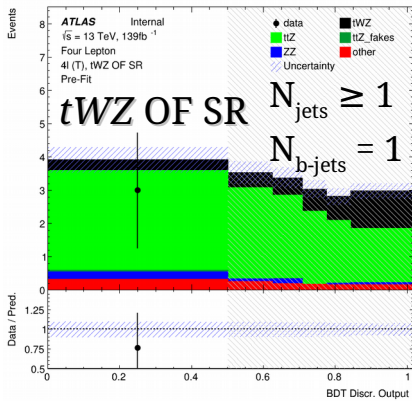
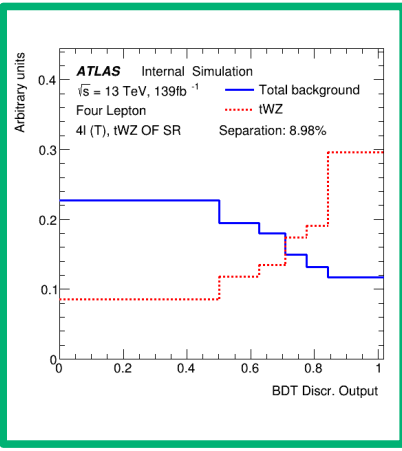
→ experimentally unobserved process

→ heavily statistically limited



BDT to distinguish between tWZ and its major backgrounds (ttZ and ZZ)

Used as input variable to BDT



Exactly 4 tight lepton with $p_T > (28, 18, 10, 10)$ GeV

A total of 2 SRs and 3 CRs

Try different v 's to match 2 top system

Signal

Background

Since I have 1 top quark, It's unlikely I'll ever look like a 2 top system...

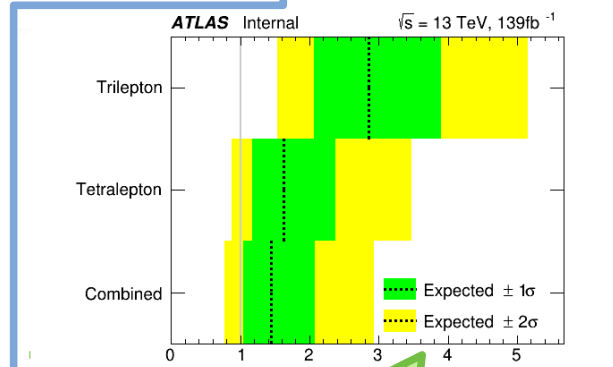
Since I have 2 top quarks, It's easy for me to look like a 2 top system!

Compare different solutions

I don't look like tWZ , but... I do look a bit like ttZ !

2 top reconstruction algorithm to distinguish between tWZ and ttZ

Blinded fit across all regions in the tripleton and tetralepton channels



Combined Expected Significance = 1.63 σ