**tW production in run 2 of the LHC with ATLAS**

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Two measurements of tW production in the dilepton channel are presented using 13 TeV ATLAS pp collisions.

**Single top production is a weak process** (cf. top pair)

- Virtual/real intermediate W (s- or t-channel) or tW
- Sensitive to new physics affecting the tWb vertex, |V_{tb}|

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**Background separation**

- Boosted decision trees (BDTs) trained to separate tW signal from t\bar{t} background
- A cut on the response is used to isolate a tW-enriched sample
- S/B ~0.5 after BDT cut

**Correcting for detector effects**

- Background-subtracted data are unfolded to particle level
- Leptons are dressed by nearby photons
- Remaining particles clustered into jets (b-tagging via ghost matching)

**Results**

- First comparison of ATLAS data to full WbWb theoretical predictions
- Single variable differential analysis in maximally interfering kinematic region

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**tWb interference analysis**

- First differential measurements of tW production at ATLAS
- Event selection
- Background separation
- Correcting for detector effects
- Results

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**Differential tW**

- First differential measurements of tW production at ATLAS

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**tWb interference analysis**

- Event selection
- Control regions for major backgrounds
- Exploiting tW kinematics

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**Background separation**

- Boosted decision trees (BDTs) trained to separate tW signal from t\bar{t} background
- A cut on the response is used to isolate a tW-enriched sample
- S/B ~0.5 after BDT cut

**Control regions for major backgrounds**

- Use the Z-mass for same flavour leptons pairs as a Z+jets control region
- Use region with extra b-tagged jet to control for top-pair plus heavy flavour

**Exploiting tW kinematics**

- 2 ways to pair objects:
  - m(b,\bar{b}) = A
  - m(b,\bar{b}) = a

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**Results**

- First comparison of ATLAS data to full WbWb theoretical predictions