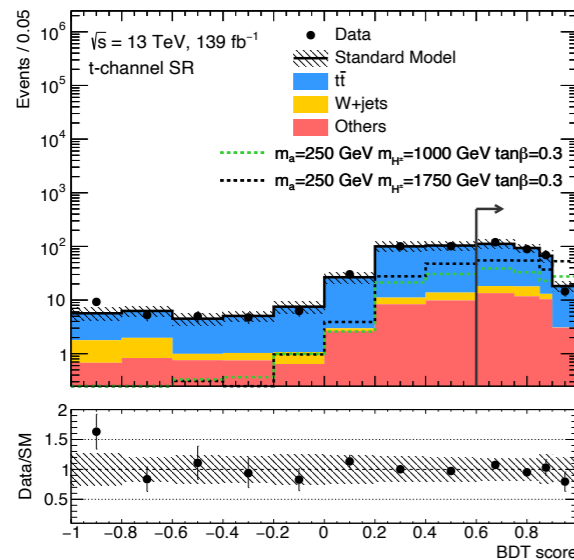


Measurements and searches within the ATLAS experiment

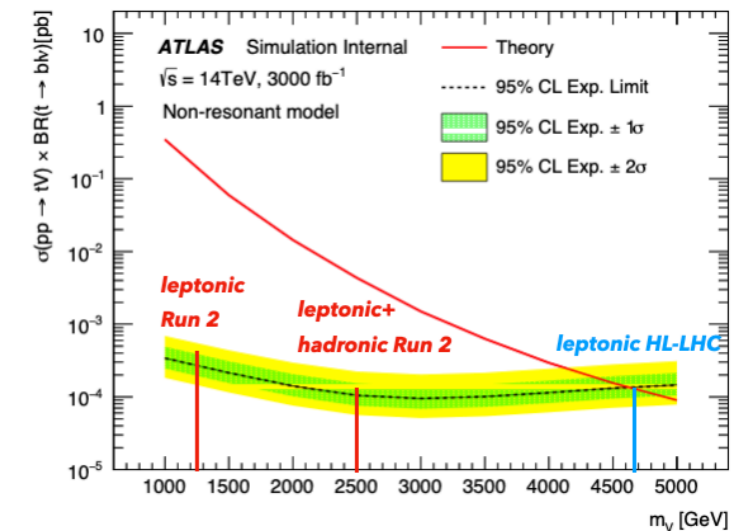
- Rare SM processes: ttH, ttZ, tH, etc (S/B + mainB/otherB)
- New physics: DM - Monotop 2HDM+a and EFT models (S/B), LLP (id. of displaced jets in the calorimeters)
- Plans: ID alignment (physics objects → images) and ATLAS upgrade ITk module/petal assembly

[arXiv:2011.09308 \[hep-ex\]](https://arxiv.org/abs/2011.09308) (submitted to Eur. Phys. J. C)



[ATL-PHYS-PUB-2018-024](#)

Experiment environment	Analysis-based	Expected mass limit at 95% CL [TeV]
HL-LHC, 14TeV, 3000 fb ⁻¹ (leptonic)	multivariate technique	4.6
HL-LHC, 14TeV, 3000 fb ⁻¹ (leptonic)	cut-based	3.2
Run 3, 14 TeV, 300 fb ⁻¹ (leptonic)	multivariate technique	3.7
Run 2, 13 TeV, 36 fb ⁻¹ (leptonic + hadronic)	cut-based	2.6
Run 2, 13 TeV, 36 fb ⁻¹ (leptonic)	cut-based	1.3



Techniques

- BDT (XGBoost) (+ kFolding for cross-validation + BDT improvement), NN and BDT with TMVA ROOT toolkit
- Using already Artemisa (many students using this)

Support

- Introductory and advance (general) courses and Artemisa tutorial