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Heavy new physics and boosted techniques

Discussion, input to the writeup

Implications of LHC results for TeV-scale physics

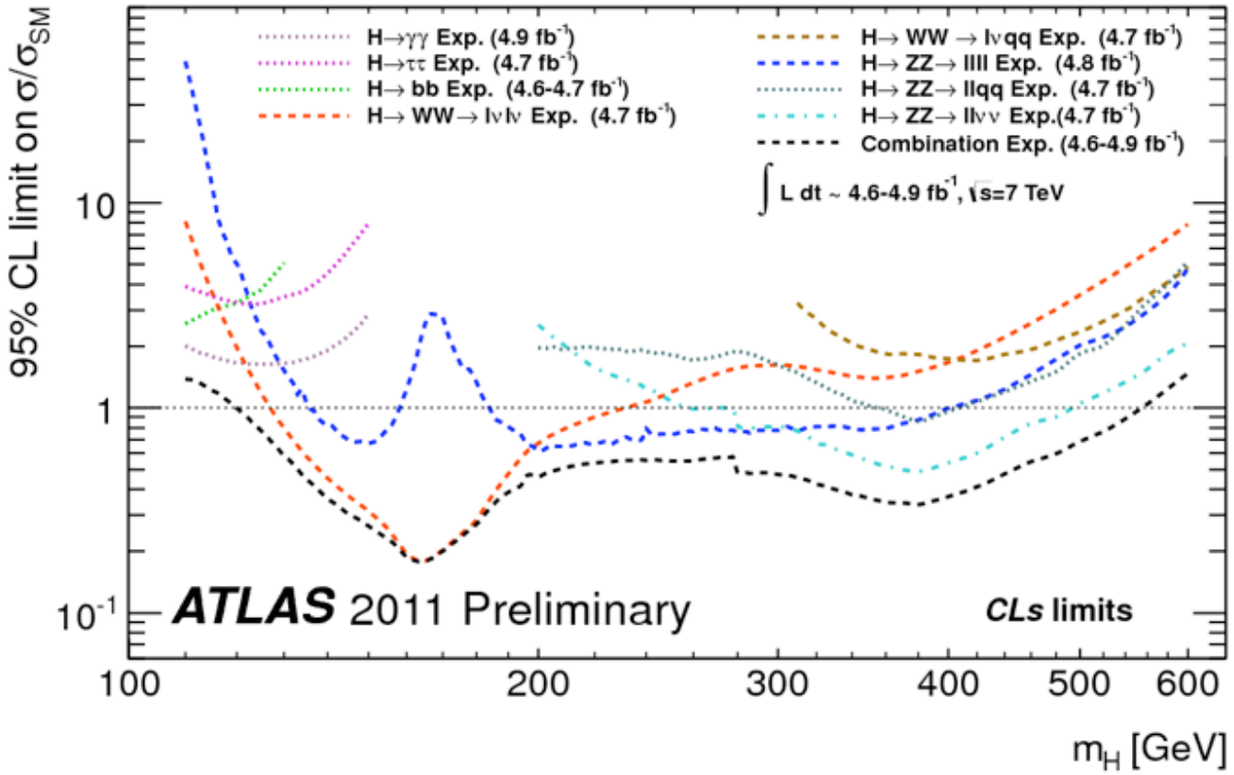
Why jet substructure?

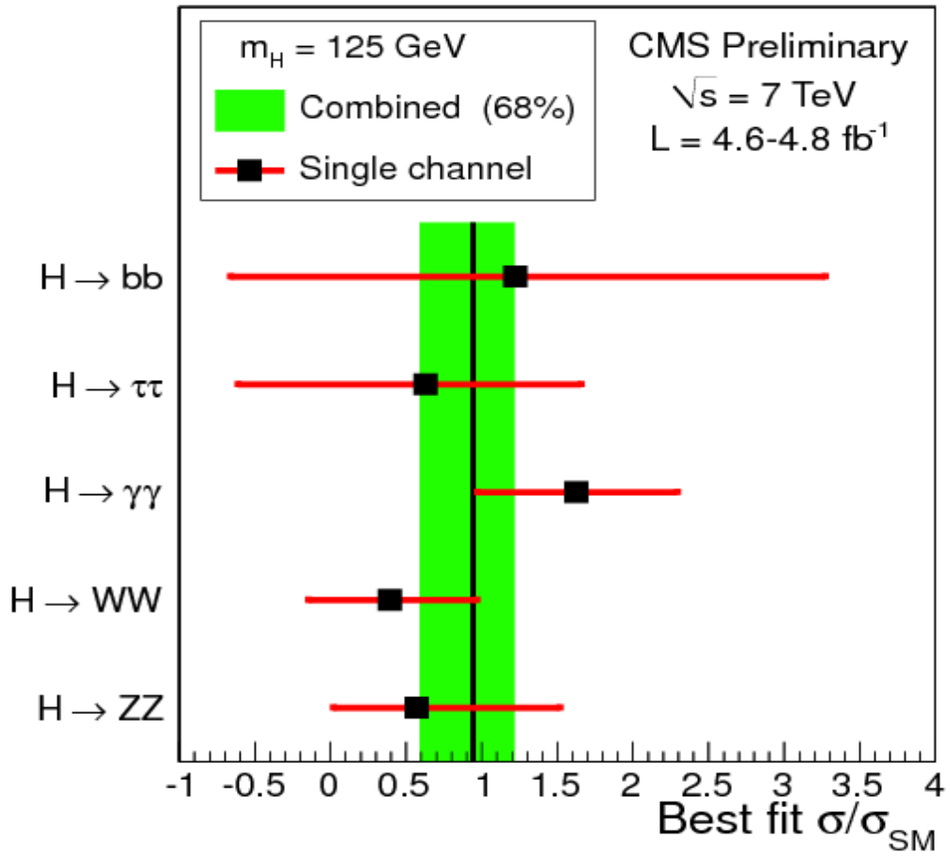
Main reasons why jet substructure is interesting & relevant:

- In TeV scale processes tops, vector bosons, Higgs & new massive particles produced boosted => massive narrow jets.
- In the moderately boosted region jet substructure tools allows us to better select signal kinematics, reject combinatorics & limit pileup contamination.

Higgs searches

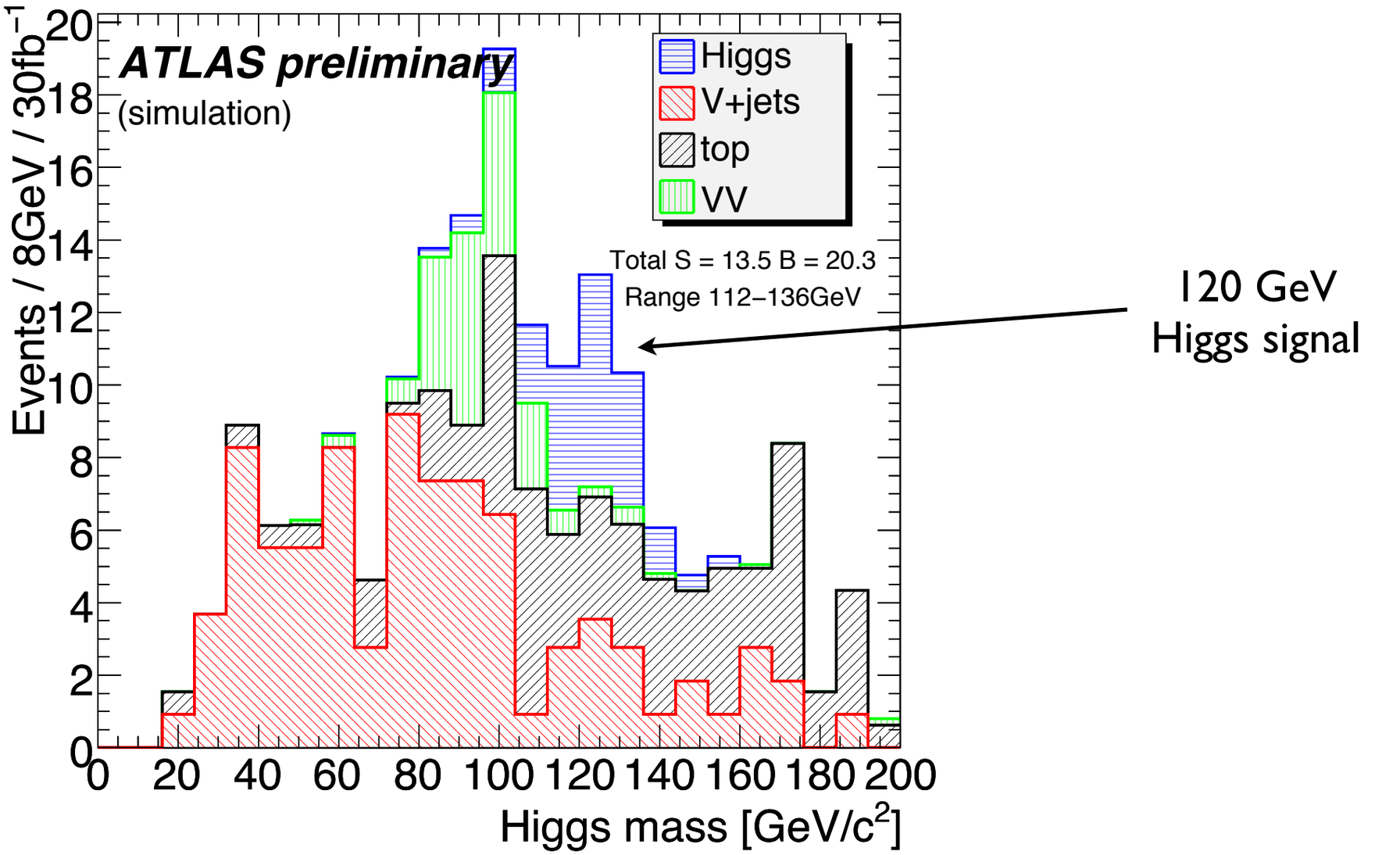
Current status of Higgs searches





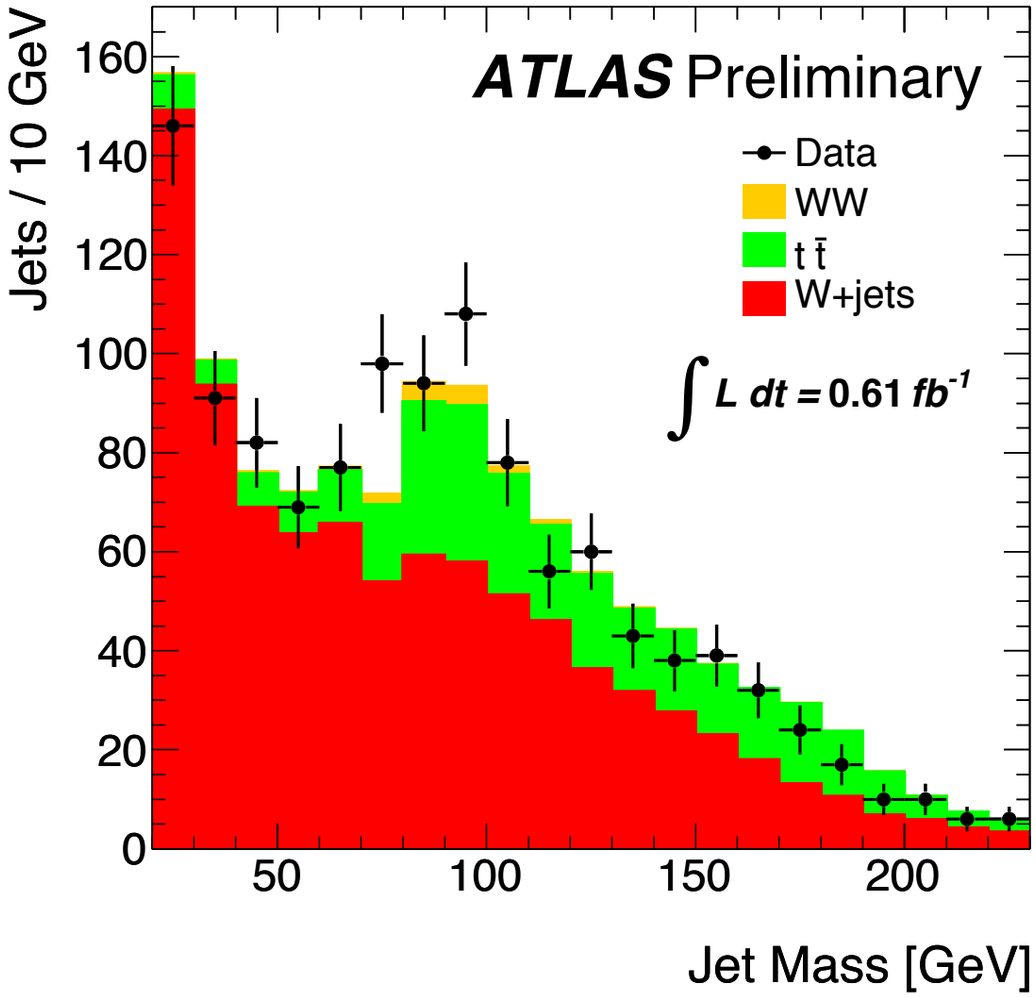
Example: ATLAS sensitivity study of boosted Higgs at 14 TeV

$$pp \to WH \to \ell\nu b\bar{b}$$



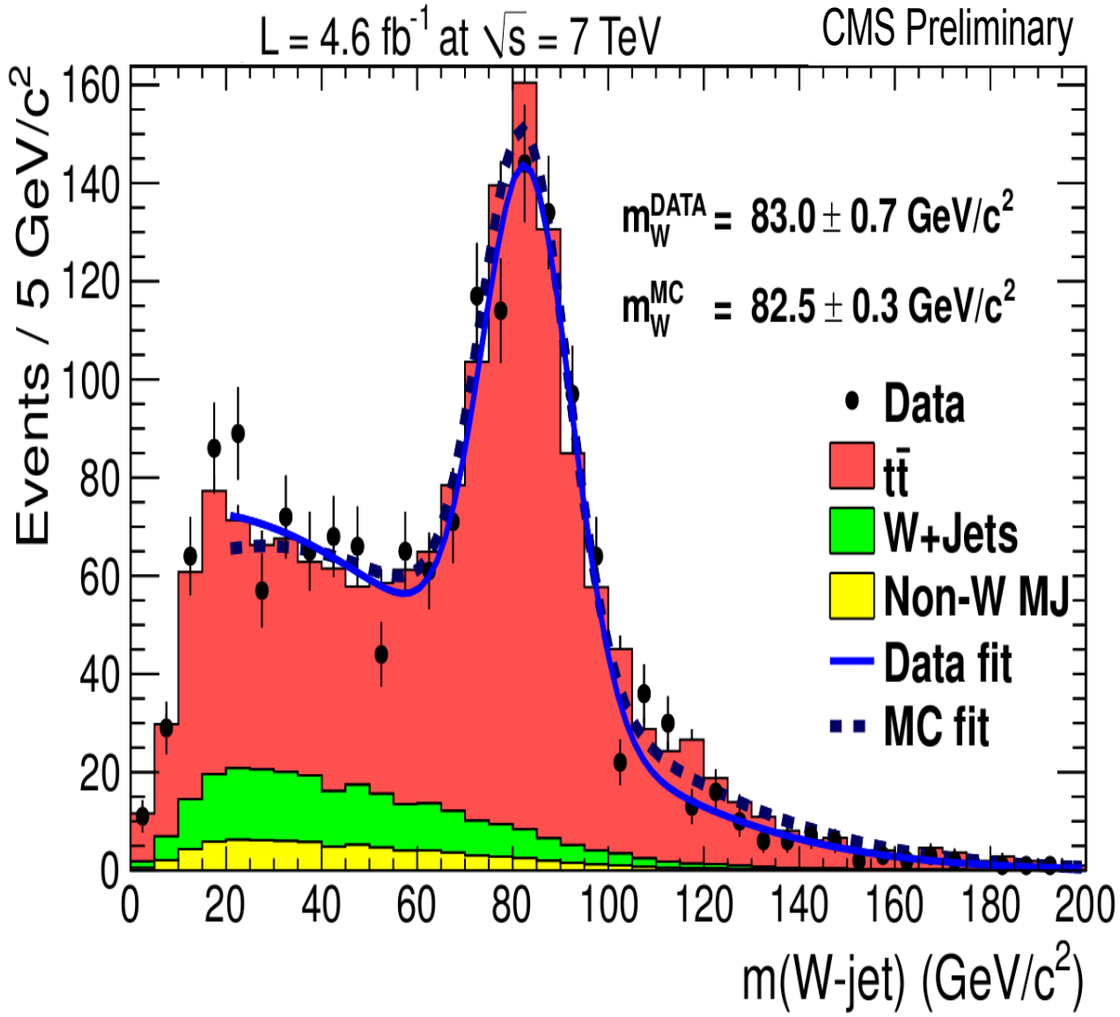
Recent results - proof of concept

ATLAS: $\ell\nu j$ no b-tagging



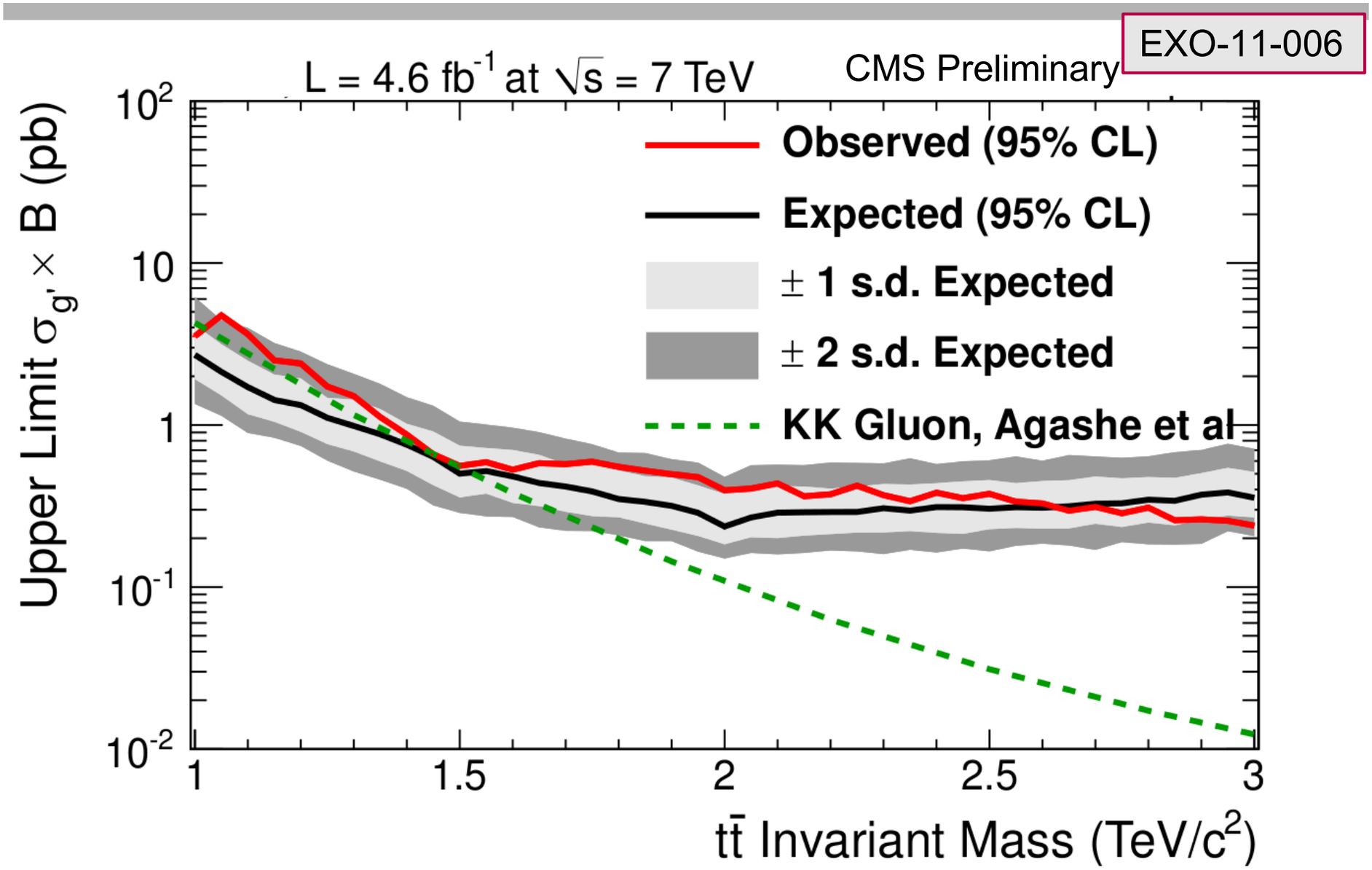
$p_T > 180\,\mathrm{GeV},\ R_{\mathrm{CA}} = 1.2$

CMS: $\ell\nu j$ b-tagged events

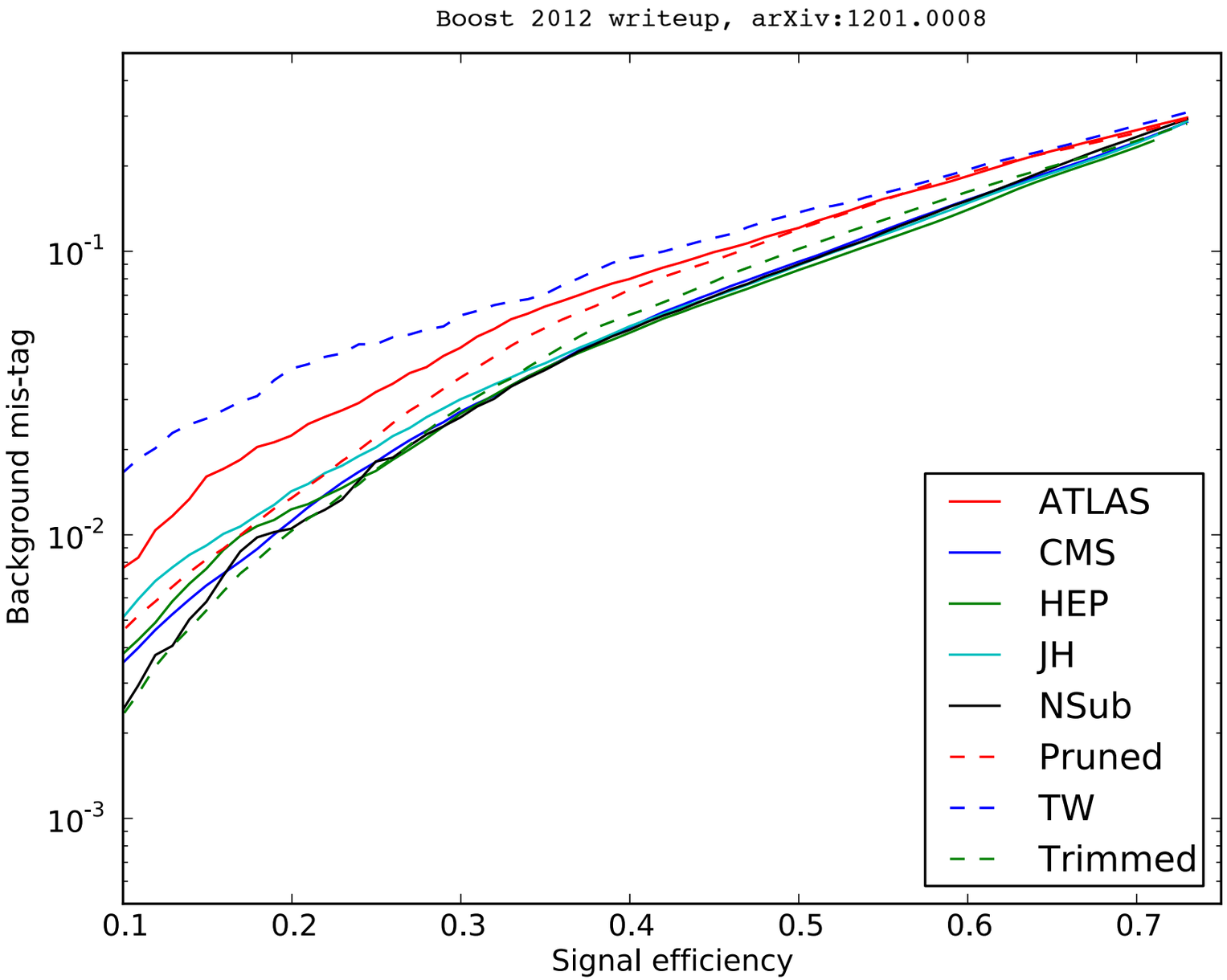


$p_T > 200\,\mathrm{GeV},\ R_{\mathrm{CA}} = 0.8$

Recent results, ongoing searches



Active work to develop and improve methods



(b) p_T 500–600 GeV, optimised

Plan for the writeup (1-2 pages)

- Brief motivation.
- Summary of achievements.
- Expectation/results for near future (before shutdown), Higgs & boosted tops.
- Outlook for the run after the shutdown.