Not a jet all the way - a search for semi-visible jets in non-resonant production mode in ATLAS

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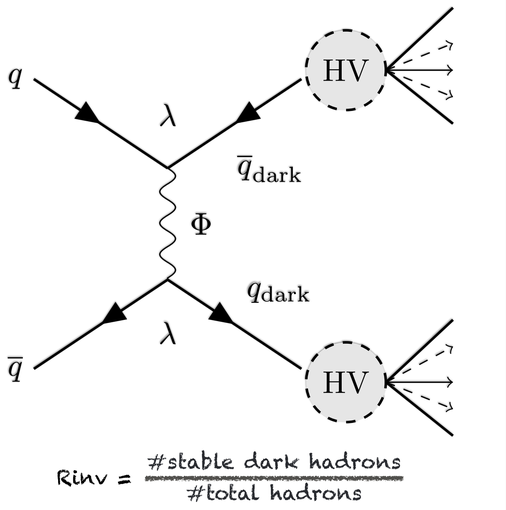
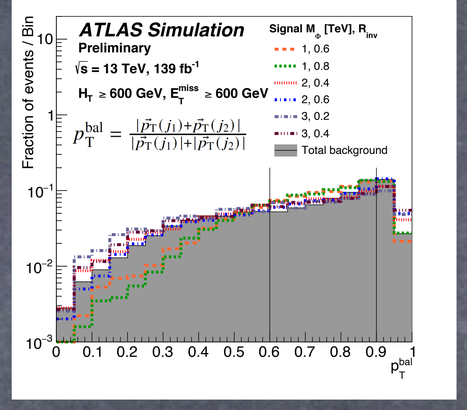
Pythia Hidden Valley module

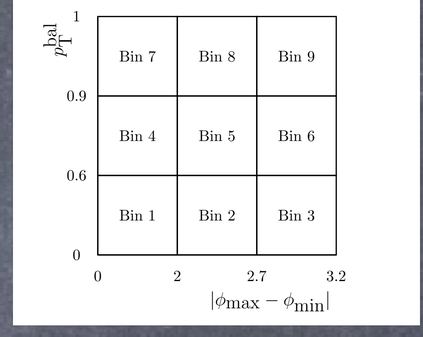


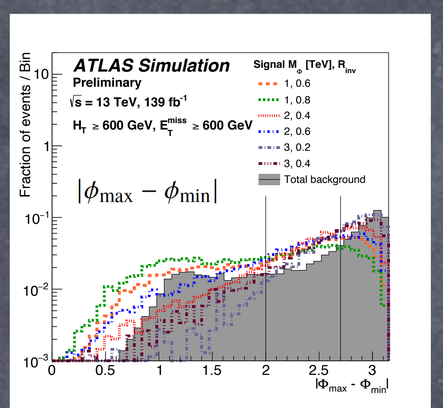
$$R_{inv} = \frac{\#\text{stable dark hadrons}}{\#\text{total hadrons}}$$

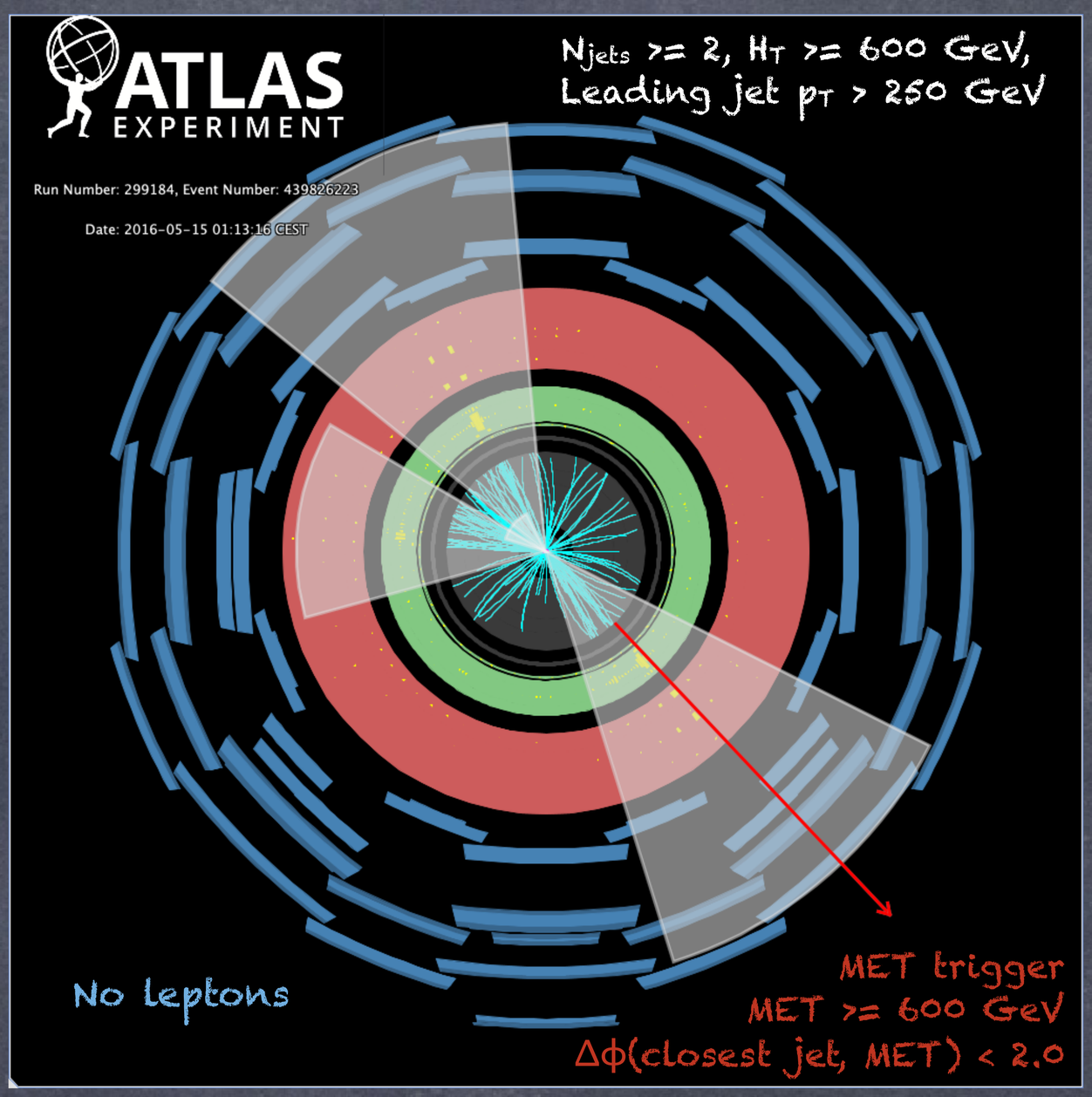
Jets interpersed with dark hadrons, with missing transverse momentum (MET) direction aligned with one of the SVJs in leading order.

Defined SR, 1L, 1L1B and 2L CRs with muon and b-tag requirements



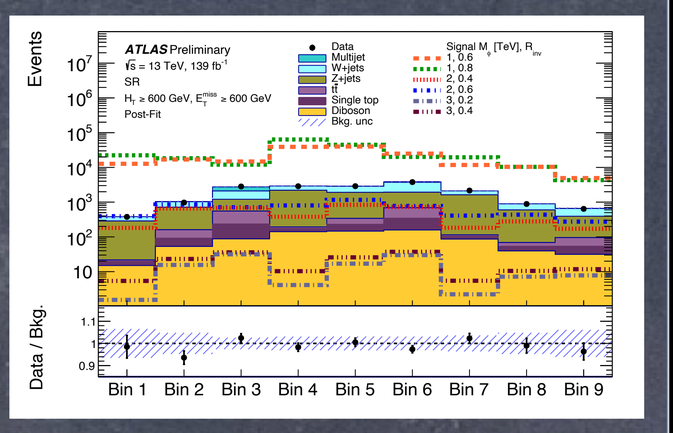




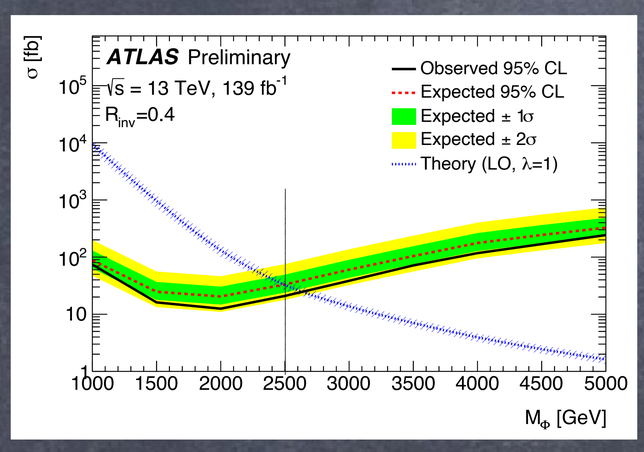


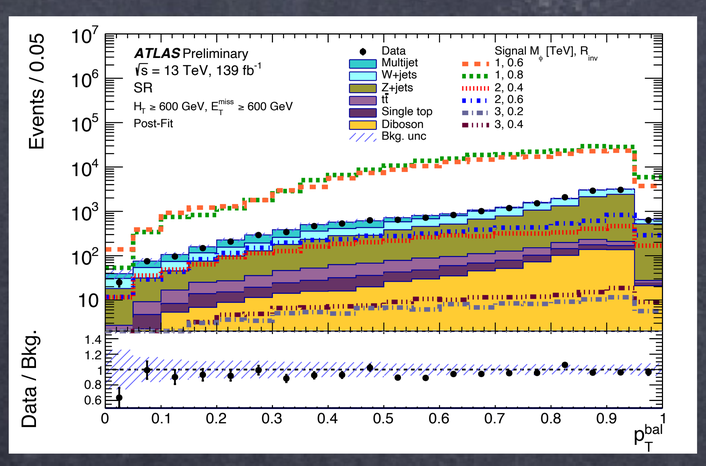
Representative signal-like event

9-bin grid using these two key observables, identically in SR and CRs

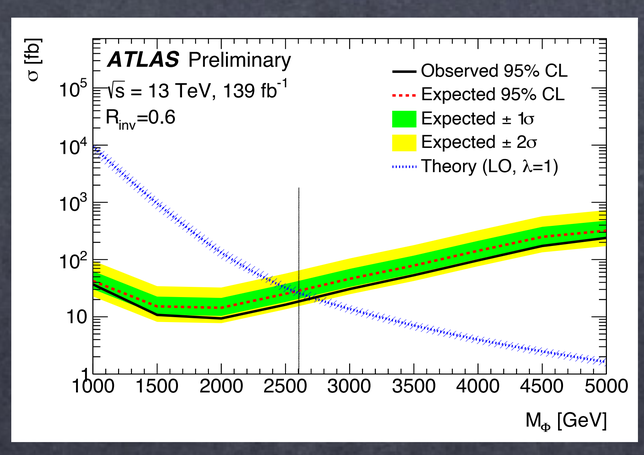


Simultaneously fit SR and CRs using 9-bin yields to estimate background



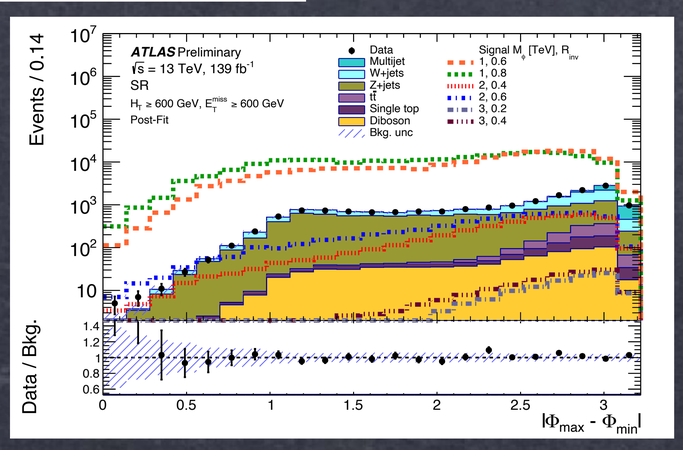


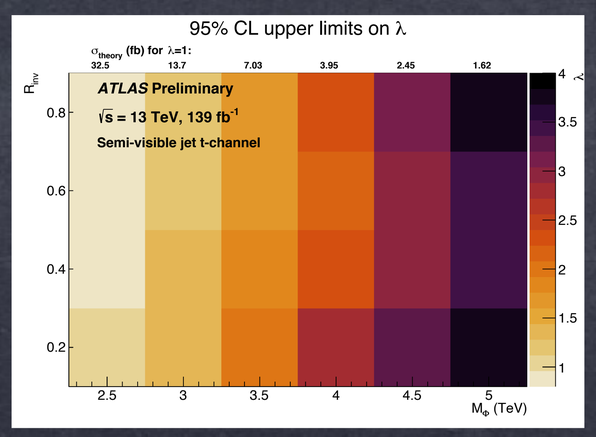
Dominant systematic uncertainties arise from theory modelling, degrades limits by about 25%.



Limits on the mediator mass, for different R_{inv} values

Good agreement between data and estimated background





Also, above the value of 2.5 TeV for the mediator mass, the q-q_d-Φ coupling strength λ is used to set limits [cross section scales as λ^4]

—> First t-channel analysis of semi-visible jets, but not the last...

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