

Search for new phenomena in final states with an energetic jet and large missing transverse momentum in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector [1].

Energy: 8 TeV

Luminosity: 20.3 fb⁻¹

Invisible Higgs Decay

- Validation has been performed versus the published expected 95% CL limits on the cross section times branching ratio for a Higgs boson mass of 140 GeV assuming BR($H \rightarrow$ invisible) = 1.
 - MC samples for the production of a Higgs boson are generated for $gg \rightarrow H$, $VV \rightarrow H$, ($V = W, Z$) and VH production channels.
 - The Monte-Carlo generator was POWHEG [2, 3, 4] interfaced with Pythia-6.4 [5].
 - The cross sections have been obtained from the Higgs working group [6] for a Higgs mass of 140 GeV.

Process	Cross Section in pb	r -value
$gg \rightarrow H$	15.42	0.51
$VV \rightarrow H$	1.389	0.19
HZ	0.2898	0.07
HW	0.47	0.11

- The signal region SR3 gives the best sensitivity which is consistent with the ATLAS study. We obtain a r -value of 0.81 for a Higgs mass of 140 GeV. This is roughly consistent within the $\pm 1\sigma$ observed limit from the ATLAS collaboration.

D8 Effective Dark Matter Operator: Thanks to Swasti Belwal

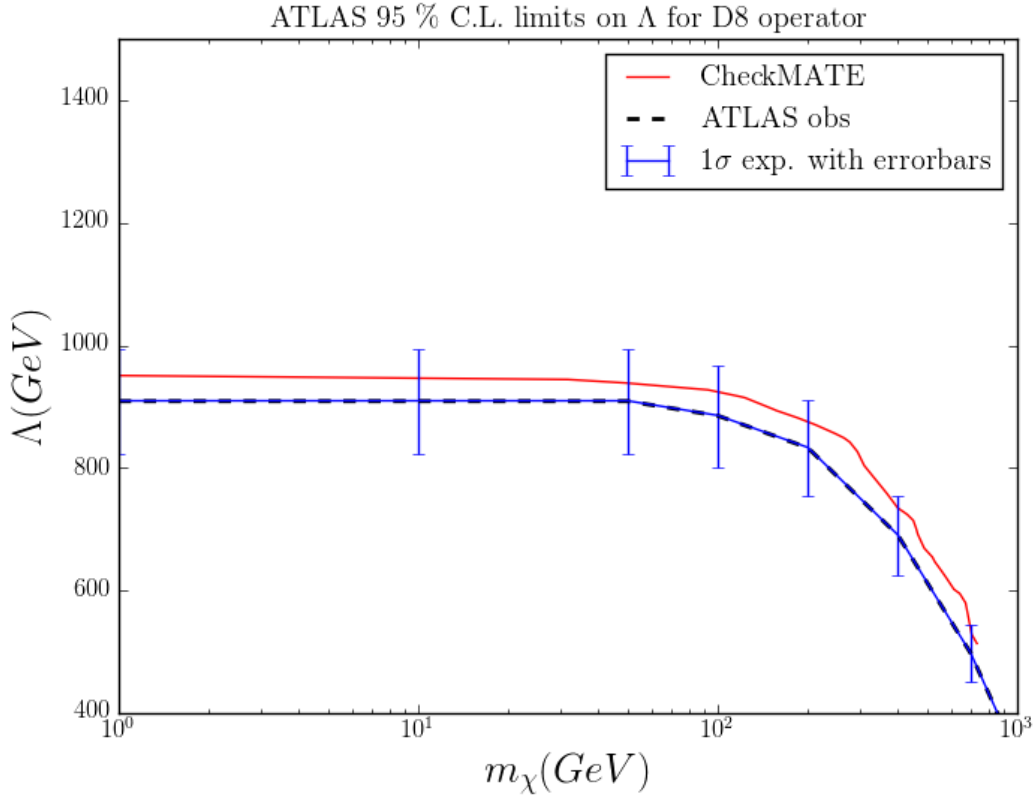


Figure 1: Lower limits at 95% CL on the suppression scale Λ are shown as a function of the WIMP mass m_χ for the D8 operator ($\frac{1}{\Lambda^2} \bar{\chi} \gamma^\mu \gamma^5 \chi \bar{q} \gamma_\mu \gamma^5 q$). The CheckMATE exclusion lies within the 1- σ error band given by the ATLAS collaboration.

- Validation has been performed versus the published expected 95% CL limits on the effective dark matter operator D8 ($\frac{1}{\Lambda^2} \bar{\chi} \gamma^\mu \gamma^5 \chi \bar{q} \gamma_\mu \gamma^5 q$).
 - MC samples are produced with MadGraph5_aMC@NLO [7] interfaced with Pythia-6.4 [5].
 - The CheckMATE exclusion is within the 1- σ error band given by the ATLAS collaboration, see Fig. 1.

References

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