

Search for high mass resonances in di-jet and di-b-jet events using 139 fb^{-1} of pp collisions at $\sqrt{s}=13 \text{ TeV}$ with the ATLAS detector

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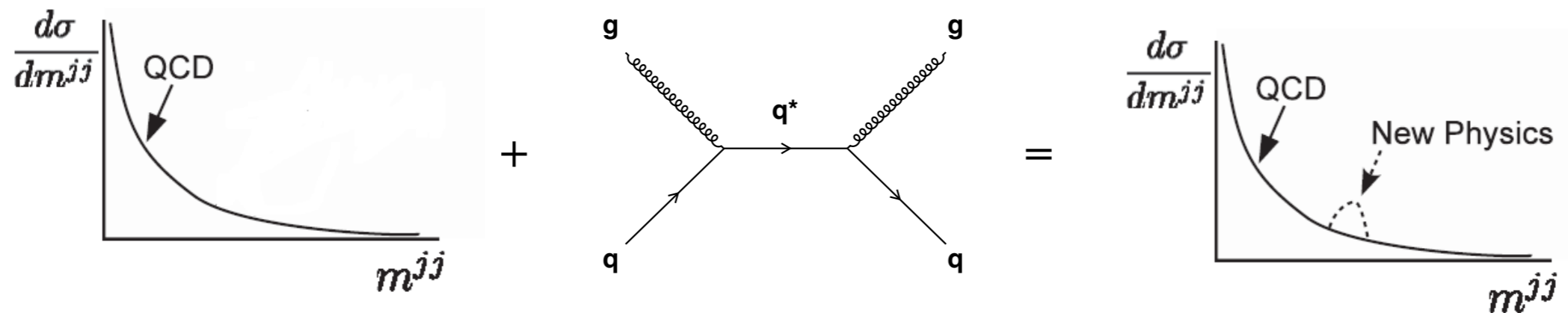
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清華大學
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- In SM, hadron collisions produce jet pairs primarily via $2 \rightarrow 2$ parton scattering processes governed by QCD;
- QCD predicts a smoothly falling dijet invariant mass distribution;
- New particles decaying to two partons may introduce local excesses.

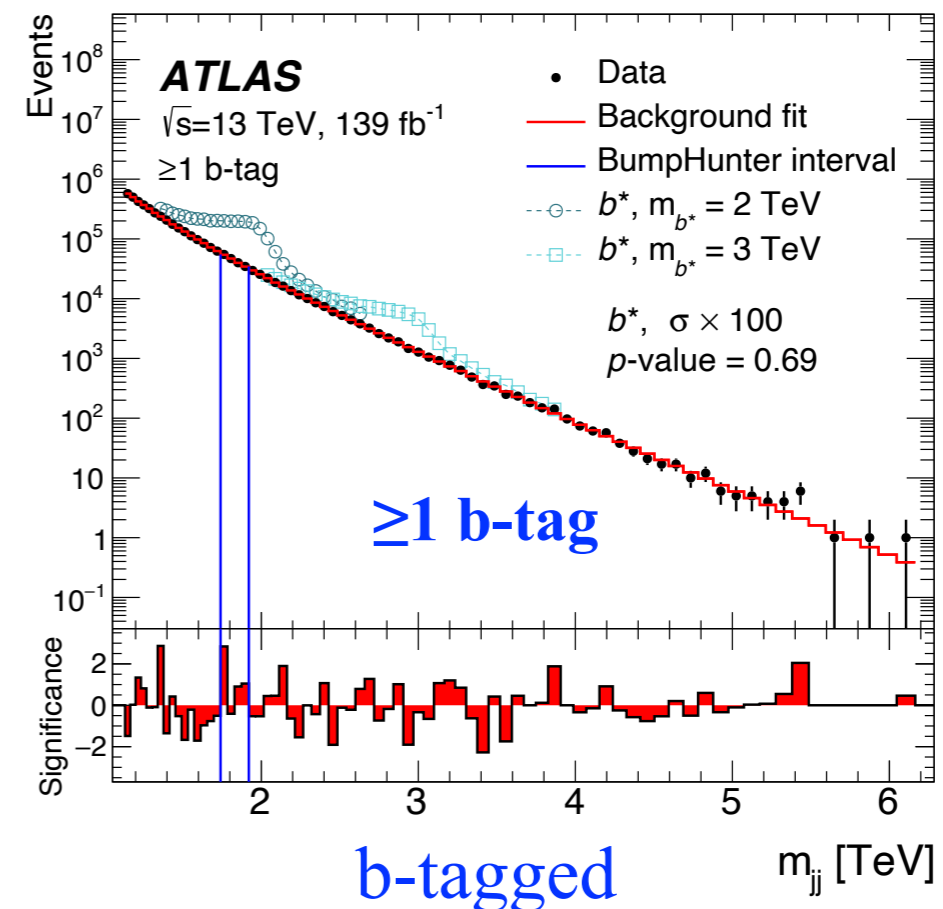
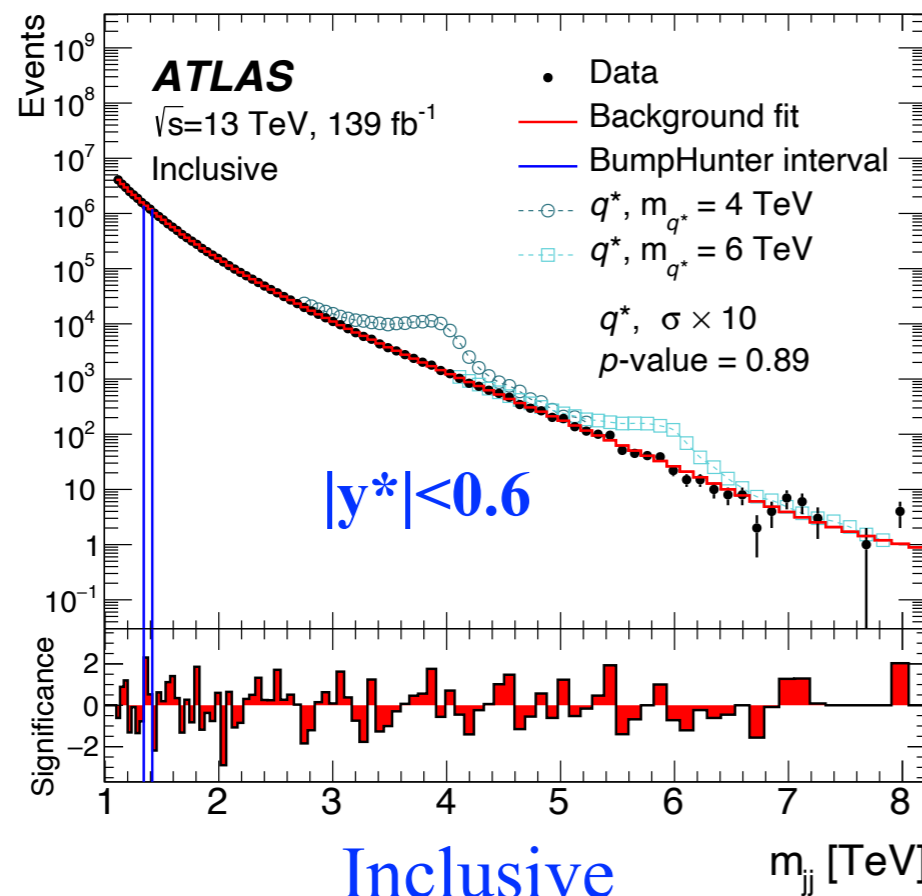


- Performed the search for high mass resonances in di-jet and di- b -jet events using 139 fb^{-1} of pp collisions at $\sqrt{s}=13 \text{ TeV}$ with the ATLAS detector.

- Using Sliding Window Fit Method to estimate background;

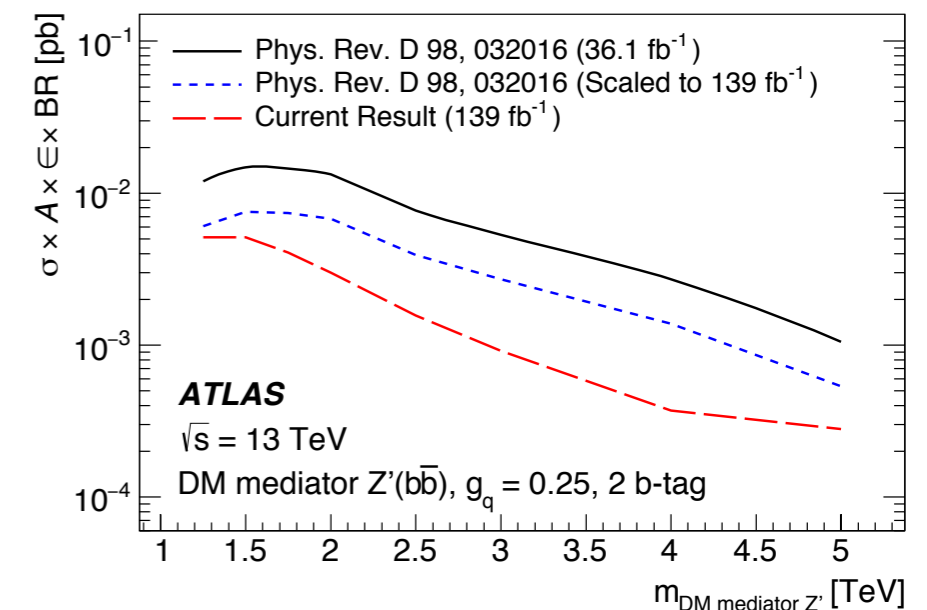
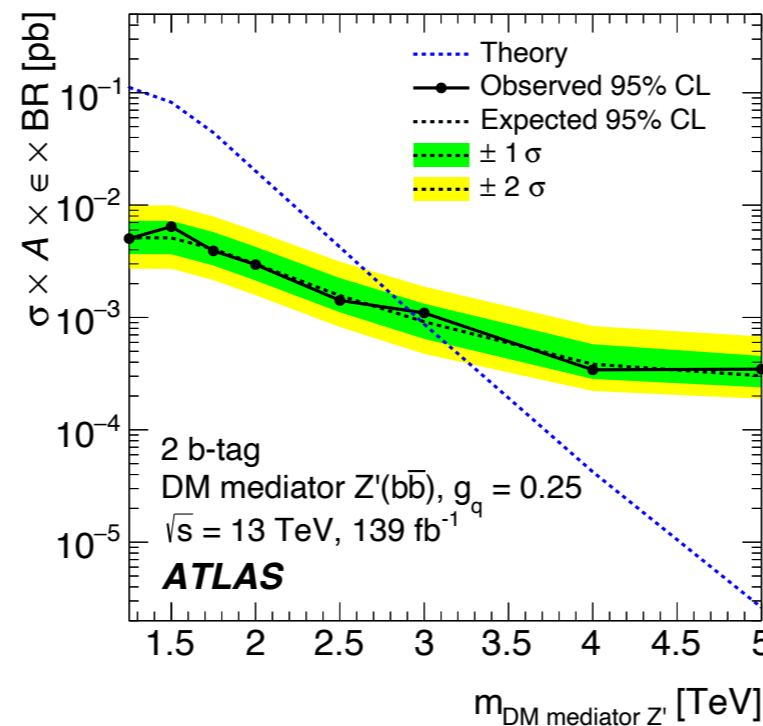
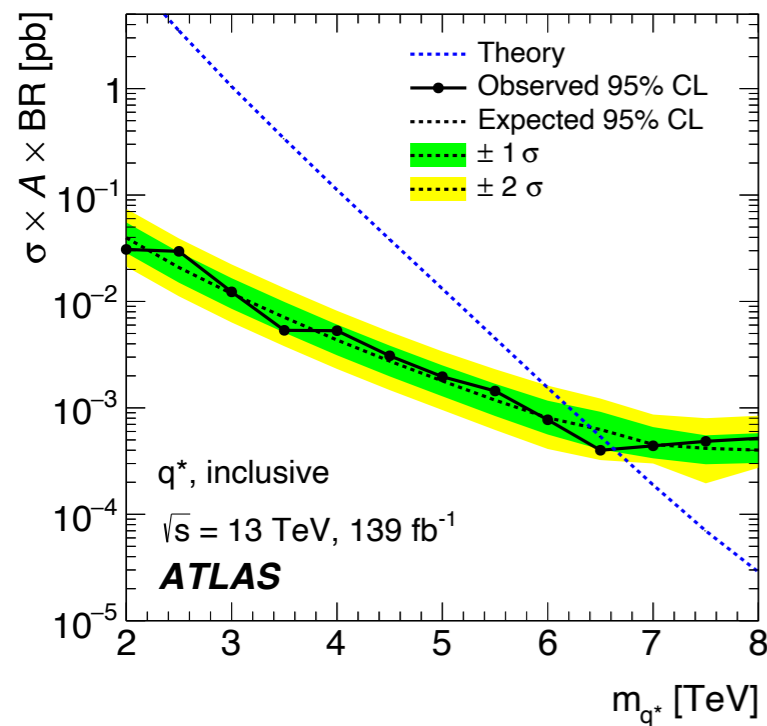
$$f(x) = p_1(1 - x)^{p_2}x^{p_3+p_4\ln x}, x = m_{jj}/\sqrt{s}$$

- Using BumpHunter Algorithm to locate local excesses above background;
- No significant excess is observed above the background.



[J. High Energ. Phys. 2020, 145 \(2020\)](#)

- CL_s technique is employed to set upper limits on several benchmarks at 95% CL .
- The first use of DL1r b -tagging at ATLAS results in a factor of up to 3.5 improvement upper limits w.r.t the previous looser b -tagging.
- More results in publication.



[J. High Energ. Phys. 2020, 145 \(2020\)](#)