

mono- $H \rightarrow bb$: ATLAS vs CMS

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- ☑ These slides might be useful if one of the motives of this meeting is to understand why we have very different results in the Z' -2HDM model phase space.
- ☑ This explains one of the differences which is non-negligible if people have forgotten about it.

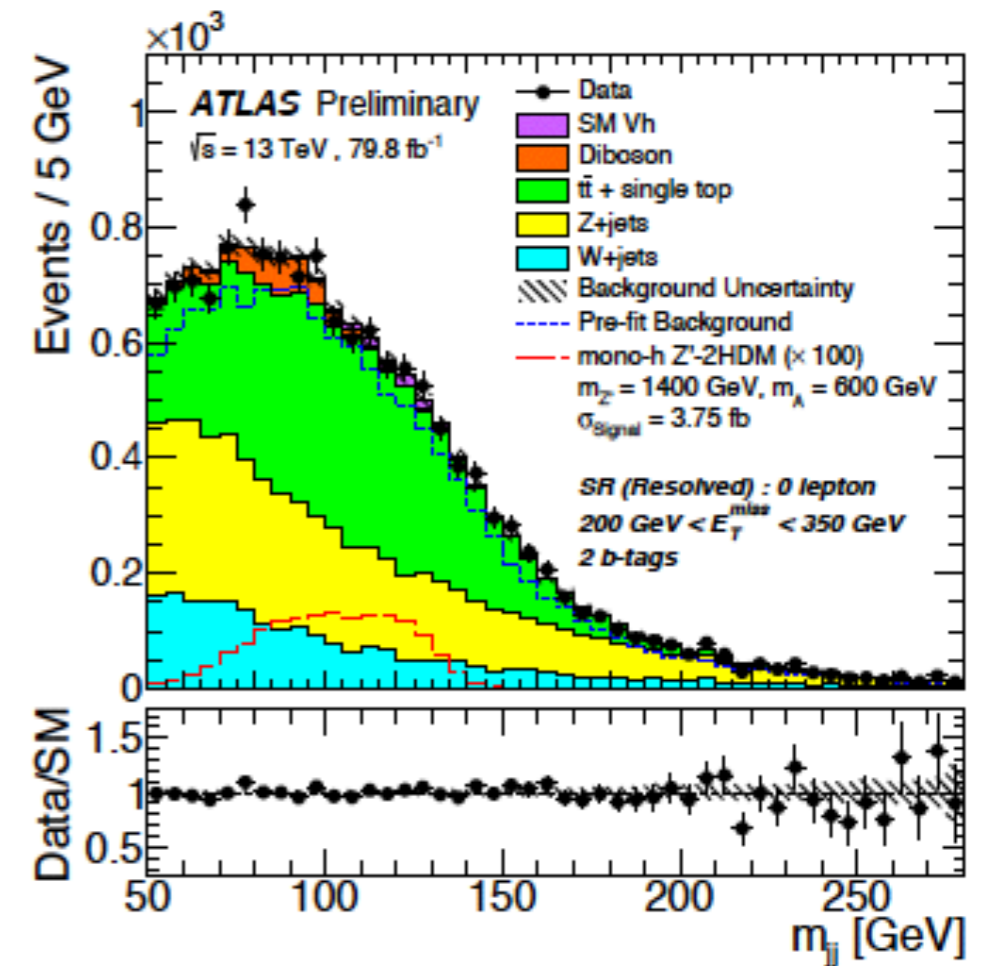
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- ☑ Back in 2017 we have cross-checked the cross-section and model parameter values with monoHbb authors (Sam Meehan et. al)
- ☑ The conclusion was:
 - ☐ we understand the changes due to difference in PDF
 - ☐ when same set of parameters are used we both get same numbers, to validate framework in each group.
 - ☐ However, ATLAS has decided to keep the parameters:
 - $m_H = m_{H^\pm} = 300 \text{ GeV}$,
 - whereas, CMS uses $m_A = m_H = m_{H^\pm}$ ($m_A = 300\text{-}800 \text{ GeV}$)
- ☑ Due to this difference in the parameter values, the theory cross-section is effected (I guess there is no change in kinematics, I might be wrong).

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- ☑ cross-section value for $(m_{Z'}, m_A) = (1400 \text{ GeV}, 600 \text{ GeV})$
 - ☐ ATLAS: 3.75 fb
 - ☐ CMS: 11.2 fb
 - CMS analyses use $\sim 3 \times$ higher cross-section for same point.
- ☑ This might be one of the reason for $m_{Z'} = 1400 \text{ GeV}$, both experiments have very different reach in m_A axis.
 - ☐ ATLAS: $m_A = 580 \text{ GeV}$
 - ☐ CMS: $m_A = 750 \text{ GeV}$

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