Weekly update

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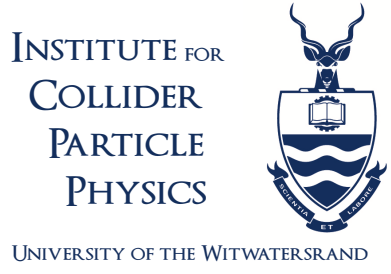
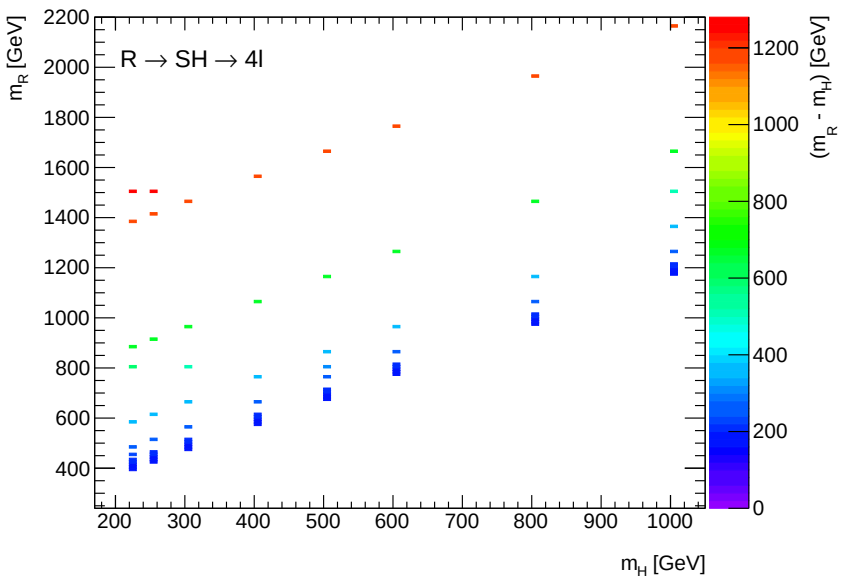
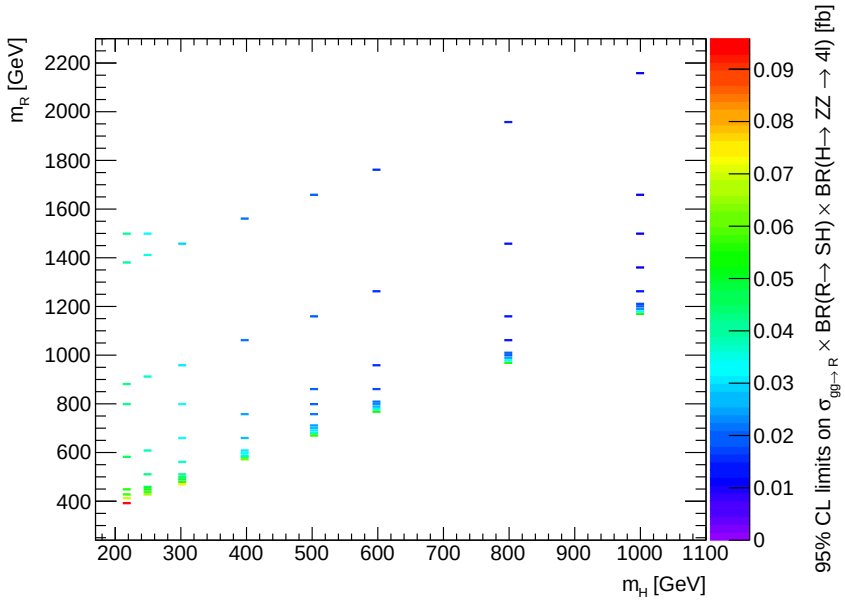
November 30, 2020



$4\ell + E_{\mathrm{T}}^{\mathrm{miss}}$ analysis

Expected upper limit for $gg \rightarrow R$





- The met controlled by the selection of the mass points, the high $m_R - m_H$ the hight met.
- On the contrary, the limit is higher at lower met samples with a few high met samples behaving differently.

$4\ell + E_{\mathrm{T}}^{\mathrm{miss}}$ analysis

Calculating the $\sigma_{gg\to A} \times \mathrm{BR}(A \to ZH) \times \mathrm{BR}(H \to ZZ \to 4\ell)$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mA:  800.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 3.09966385346e-07
mA:  800.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 0.346061760246
mA:  800.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 0.33880262355
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 1.7893314473e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 1.7886902501e-07
mA:  1000.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 3.30373504648e-05
mA:  1000.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 3.28431978251e-05
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 1.7893314473e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 1.7886902501e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 1.7893314473e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 1.7886902501e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 2.70180620148e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 2.70073302214e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 2.70180620148e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 2.70073302214e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 2.70180620148e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 2.70073302214e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 3.24433600384e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 3.22469909634e-07
mA:  900.0  mH:  200.0  ggA*BR(A_ZH)*(HZZ) 3.24433600384e-07
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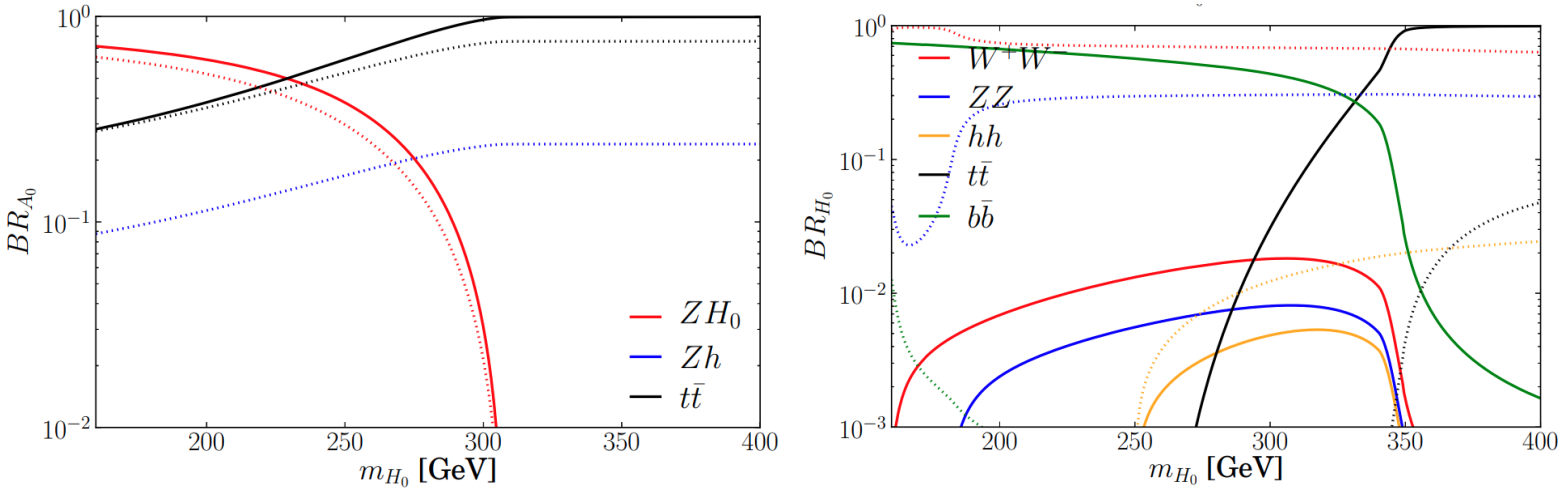
- Using 2HDMC to try to calculate the $\sigma_{gg\to A}$ times branching ratio.
- However, some of these numbers are pretty much small.
- So I'm working on reducing the number of grid to, for instance 2 mass points.
- Then tuning couplings parameters such as $\cos(a-b)$ and $\tan(\beta)$

$4\ell + E_{\mathrm{T}}^{\mathrm{miss}}$ analysis



- I got these plots from the theory paper of the AZH model.
- These valuse could be used as a cross-check for the calculated ones.

Thank you!