

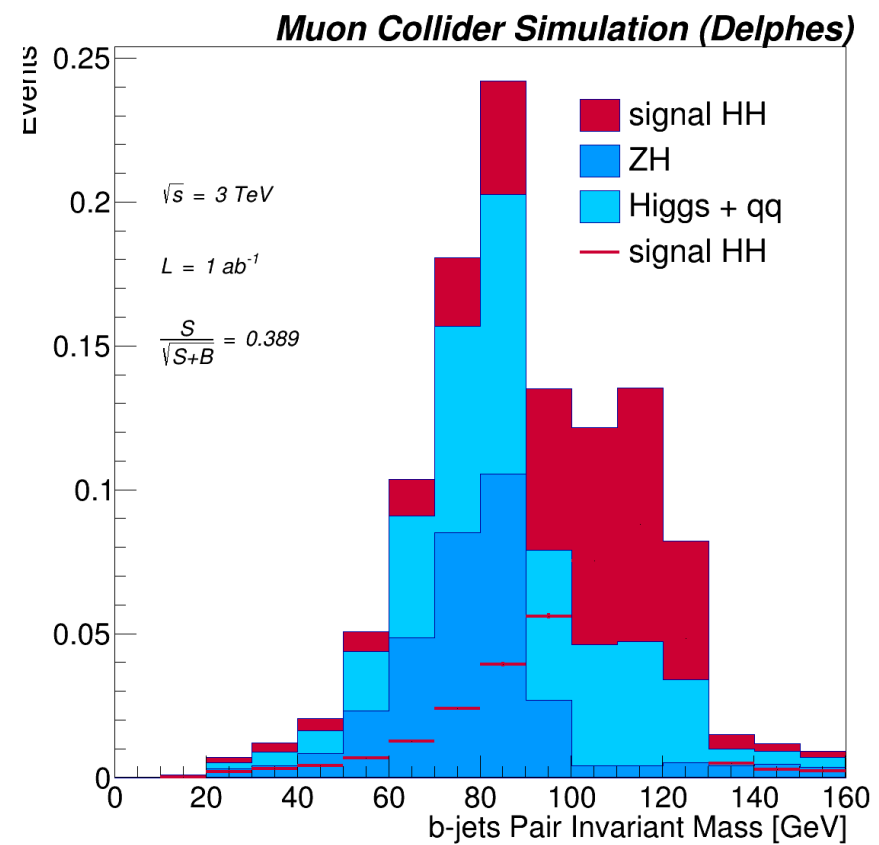


Feasibility Study of Measuring the Higgs Self-coupling Using the Muon Collider

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Final states / $\sqrt{s}$ ($\int d\mathcal{L}$)	3 TeV (1 ab ⁻¹)	6 TeV (4 ab ⁻¹)	10 TeV (10 ab ⁻¹)	30 TeV (10 ab ⁻¹)
$b\bar{b}b\bar{b}$	1.176	2.812	4.571	5.690
$b\bar{b}\gamma\gamma$	0.389	0.922	1.392	1.823
$b\bar{b}\tau_{\text{had}}\tau_{\text{had}}$	0.902	2.604	4.029	4.803
$b\bar{b}\tau_{\text{lep}}\tau_{\text{had}}$	0.989	2.856	4.340	5.040
Combine	1.728	4.597	7.166	8.678

Table 5: Significance for the extraction of di-Higgs events combining all studied channel using various analysis techniques for muon colliders operating at various centers of mass and integrated luminosity.



- Apply cut on m_{bb} for $bb\gamma\gamma$ channel to optimize the signal significance
- Combine significance by Stouffer's method:
 $S = S_{\text{sum}}/\sqrt{4}$
- Wrote analysis procedure for all channels.