Notes on SM Backgrounds to the Proposed CLIC Benchmarks

M Battaglia

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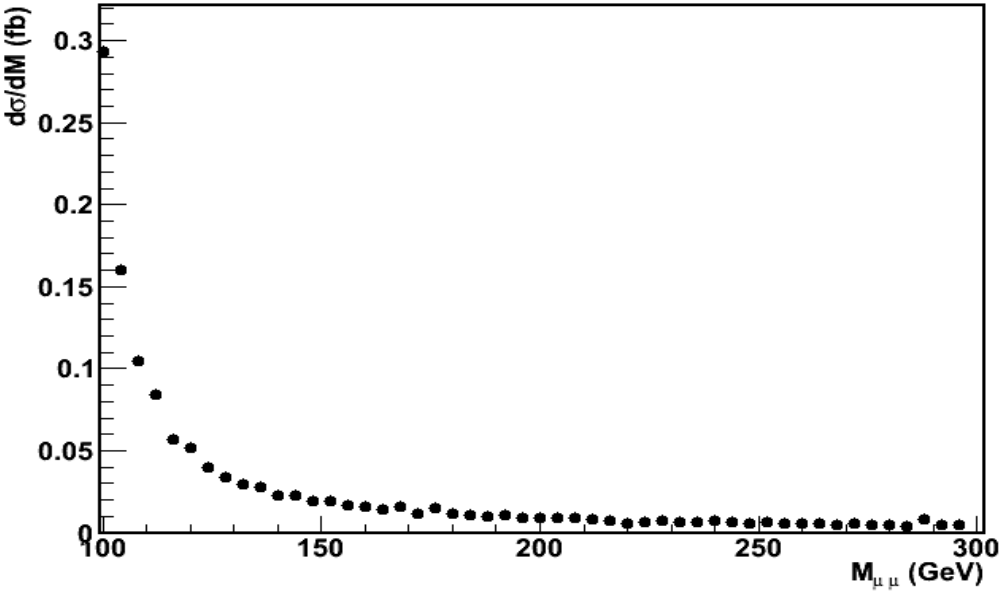
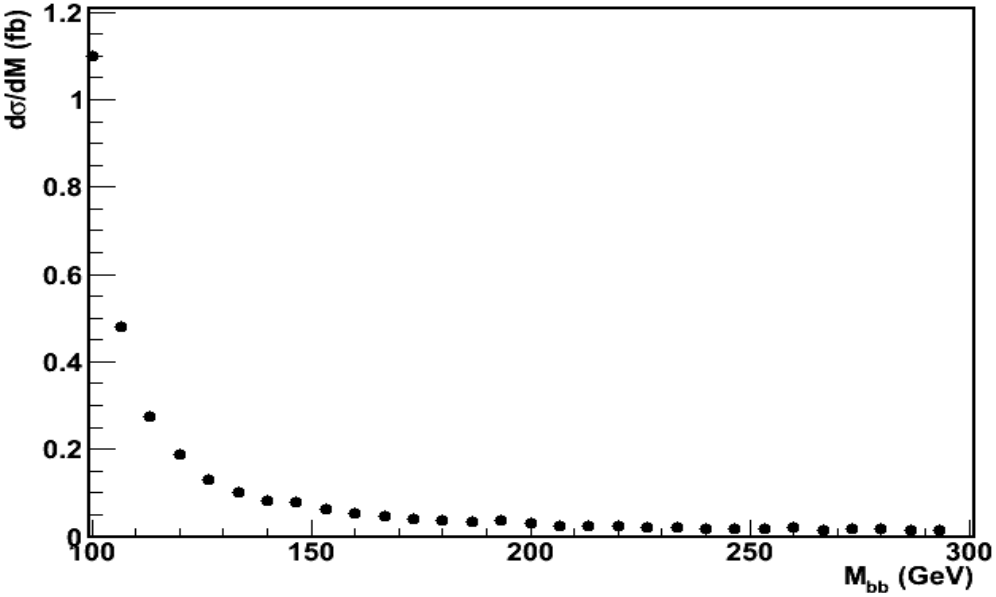
μμνν and bbνν

Assume M_H = 120 for H → μμ and 185 for H → bb (Summer 2010 blue-band one-sided 95% CL upper limit when combining EW data and LEP-2 limits, 10 GeV above Tevatron exclusion), μμνν also irreducible bkg to $\mu_R\mu_R$ analysis.





	100<M<300	110<M<130
μμνν	7.7 fb	1.24 fb

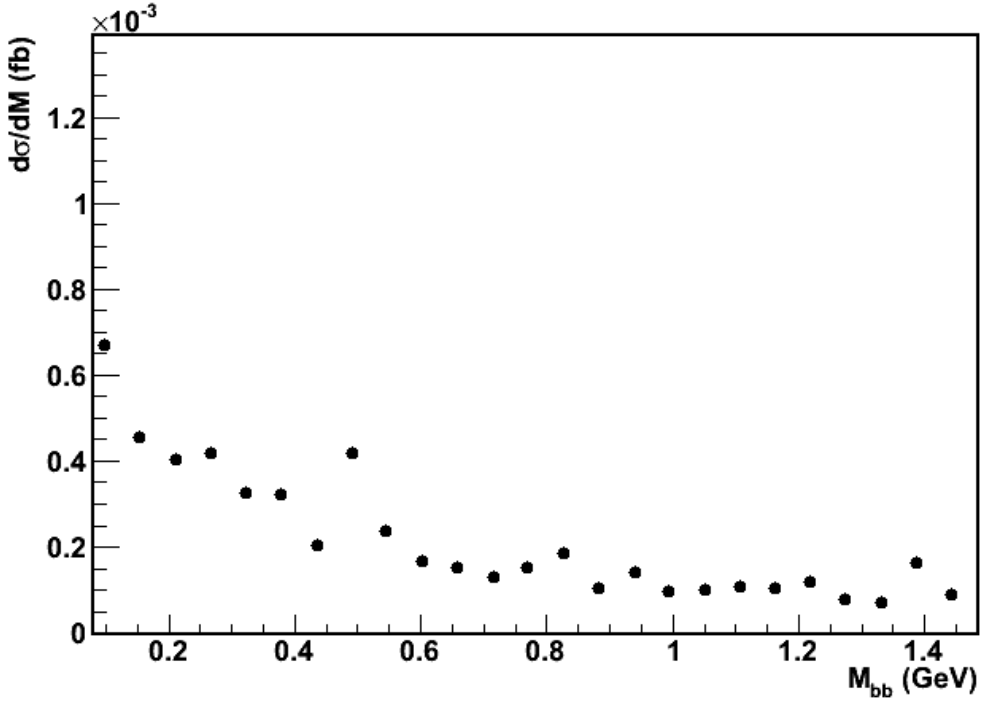
μμνν from WW production:
780 fb x $(0.106)^2$ = 8 fb
from ZZ production
48 fb x 0.03 x 0.2 = 0.3 fb

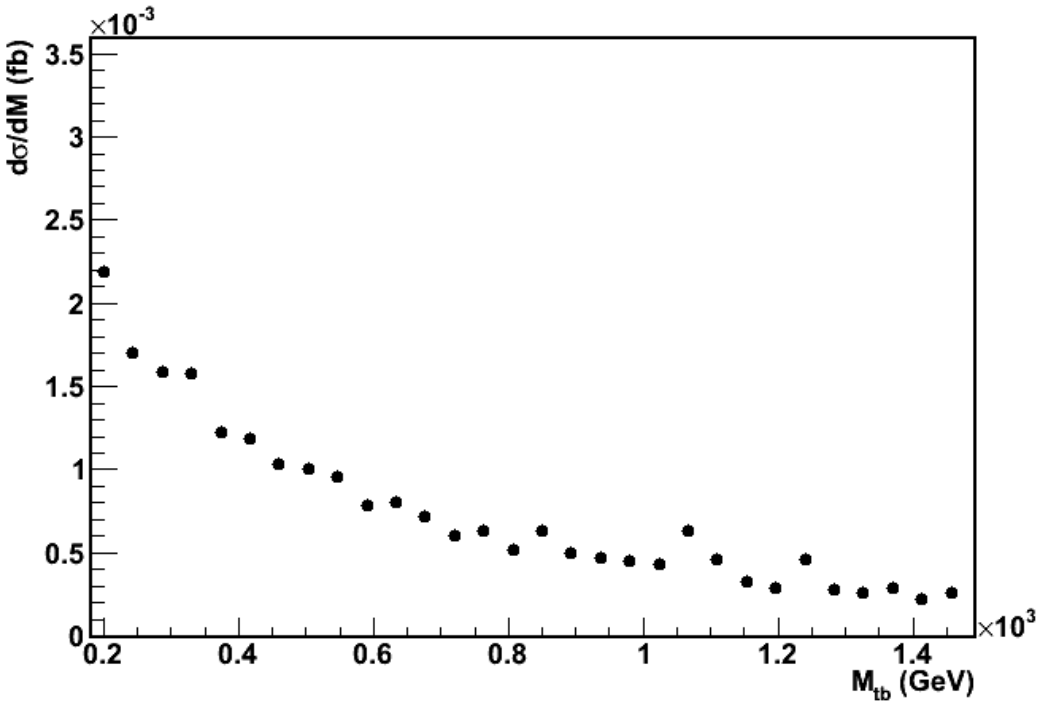
	100<M<300	140<M<220
bbνν	20.5 fb	3.9 fb
ccνν	15.6 fb	2.8 fb
qqνν (q=uds)	52.3 fb	9.5 fb

bbνν from ZZ production:
48fb x 0.20 x 0.15 = 1.4 fb

bbbb and tbtb

Irreducible SM bkg to H^0A^0 and H^+H^-

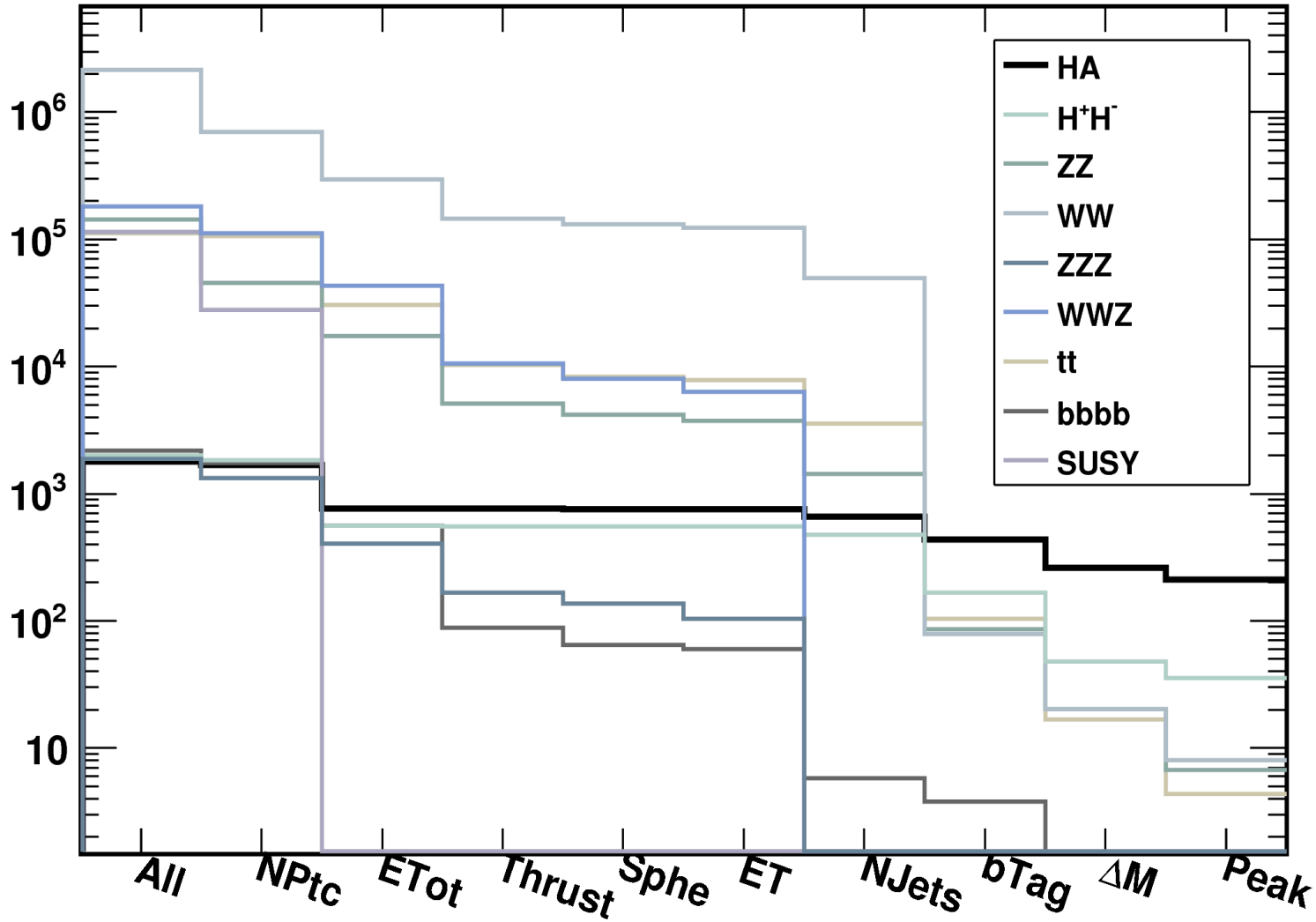




	200<M<1500	800<M<1200
bbbb	0.48 fb	0.05 fb

	200<M<1500	800<M<1200
tbtb	1.10 fb	0.03 fb

$H^0A^0 \rightarrow bbbb$



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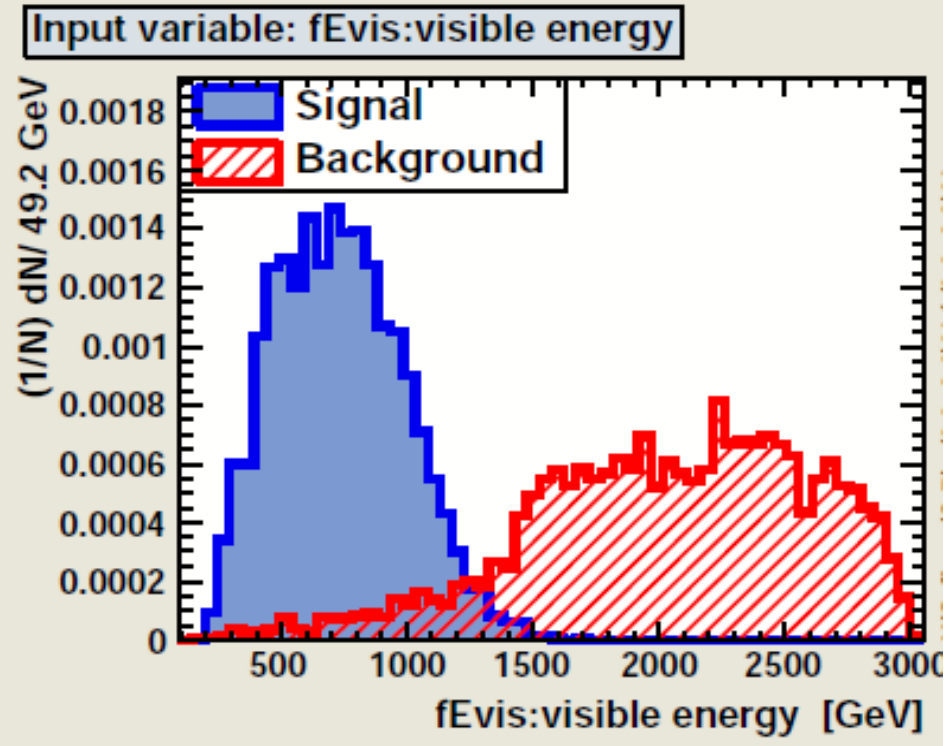
$W^+ l E_{missing}$

Irreducible SM bkg to χ^+ analysis

		$\lvert\cos\theta_e\rvert<0.985$	$E_\nu>1450$	$En > E_{beam}$
W e ν	6.7 pb	373 fb	114 fb	0
WW → Weν	168 fb	47 fb		



JJ Blaising

Discussion Points

Irreducible SM bkg to proposed benchmarks > than sum of fermion pairs and boson pairs → Production of benchmark-specific dedicated bkgs seems advantageous in several cases;

Preselection of events allows to largely reduce the effective cross section with “safe” cuts;

Still need some samples of WW, ZZ, WWZ, ZZZ, tt, qq, … to study bkg from mis-id, mis-reconstruction, whenever analysis uses discriminant likelihood can weight events, not cut.