

KK gluon in the RS model of warped extra dimensions update

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KKgluon Reconstruction

Ref: M. Villaplana presentation, (6 August Jet+X) and ATL-PHYS-PUB-2006-002

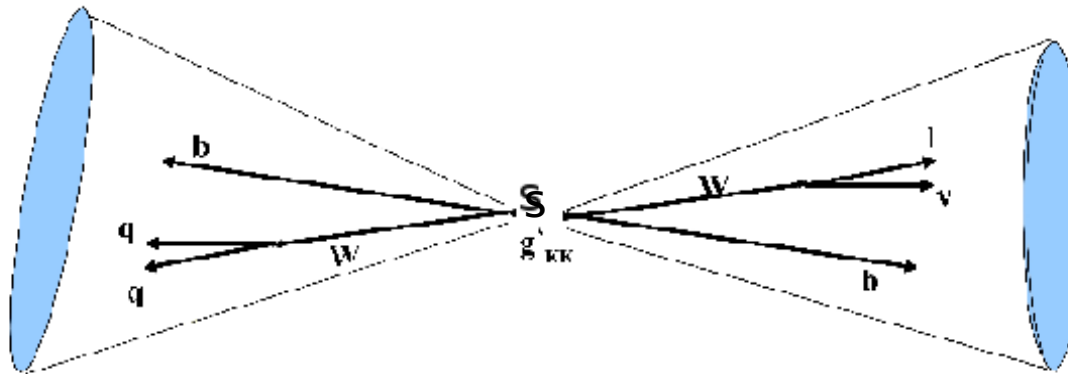
1° Isolated lepton (e, μ) $p_T > 25$ GeV

2° Missing transverse energy $E_{\text{miss}} T > 25$ GeV, $p(\nu) \parallel p(\text{lep})$

3° Leptonic top: add highest ET jet with $\Delta R_{\text{jet_lep}} < 2$

4° Look for highest ET jet with $\Delta R_{\text{jet_lep}} > 2$

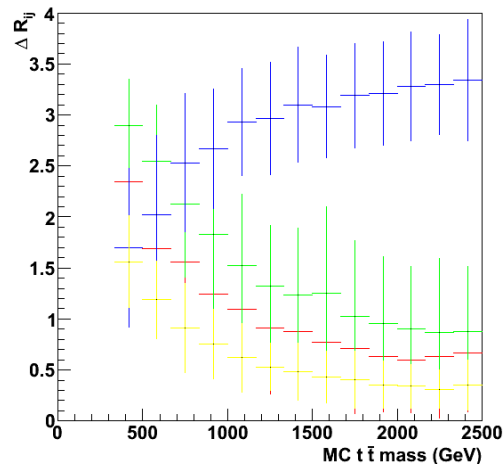
5° Hadronic top: sum all jets with $\Delta R_{\text{jet_jet}} < 1$



KKgluon Reconstruction

Transition Region

The MC truth level R distance between final state objects depends strongly on top p_T (boost) and resonances mass.



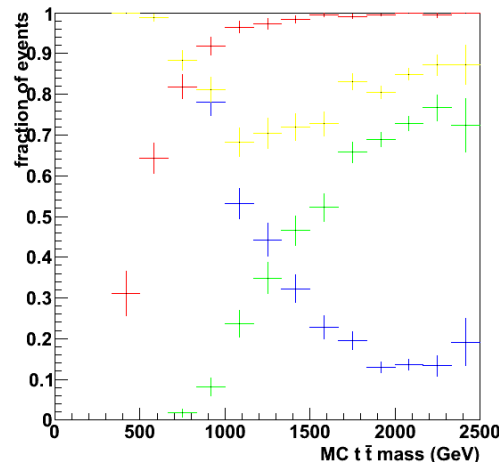
Red Leptonic Top: $\Delta R_{lep-bjet}$

Green Hadronic Top: ΔR_{jj}^{max}

Yellow Hadronic Top: ΔR_{jj}^{min}

Blue Hadronic-Leptonic: $\Delta R_{lepton-parton}^{min}$

Low mass- \rightarrow Spherical; High mass- \rightarrow Mono jet



Blue Hadronic Top: $\Delta R_{qq}^{min} > 0.5$

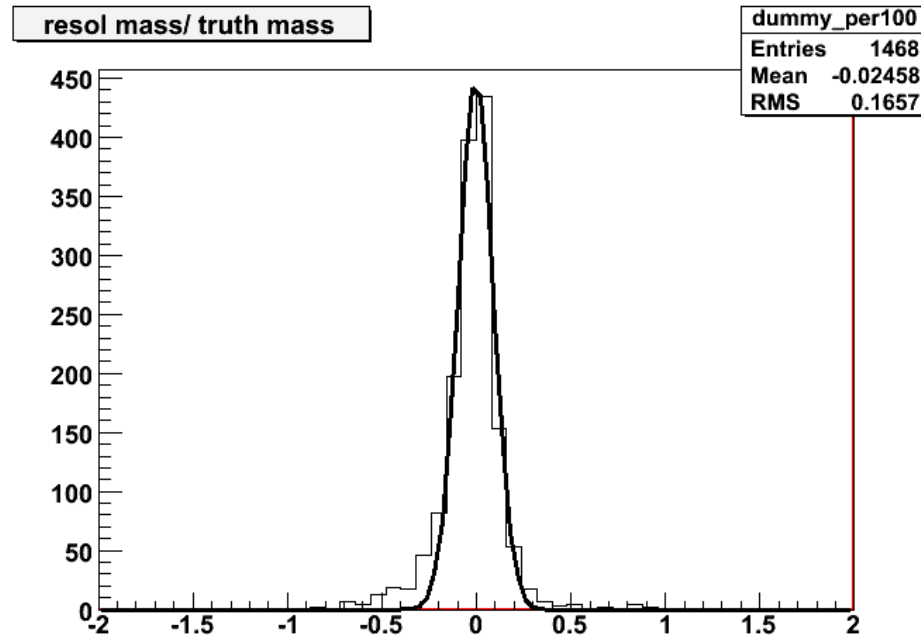
Green Hadronic Top: $\Delta R_{qq}^{max} < 0.5$

Yellow Green or Blue

Red Leptonic Top: $\Delta R_{lb(leptonic)} < \Delta R_{lq(hadronic)}^{min}$

Resolutions

For $M_{g^{*}KK} = 1\text{TeV}$



$M_{g^{*}KK}$	1000 GeV/c ²	1500 GeV/c ²	2000 GeV/c ²
$\Delta M_{g^{*}KK}$	9.32%	8.32%	7.51%

Reconstruction Efficiencies

	EF_mu20	Suitable lepton found	MET	+2 jets	reconstruction
1 TeV gKK	69,85%	68,19%	60,21%	59,00%	51,46%
ttbar	62,88%	58,04%	49,72%	49,54%	40,22%
w+jj	48,42%	42,91%	32,97%	28,82%	9,41%
ttbar+(w+jj)	53,68%	48,41%	39,06%	36,35%	20,61%

Selection Efficiencies

	Hadronic top mass > 100 GeV	Leptonic top mass > 100 GeV	pt tops > 150 GeV	# jets in hadronic cone > 2
1 TeV	42,40%	39,28%	38,26%	29,36%
ttbar	19,51%	18,27%	11,26%	10,89%
w+jj	1,00%	0,91%	0,48%	0,46%
ttbar+(w+jj)	7,73%	7,22%	4,40%	4,25%

Conclusions

- We reconstruct the resonance assuming hadronic and leptonic tops are well separated.
- This reconstruction method works better in the transition region.
- It provides a good background rejection as well (especially $w+jj$).