



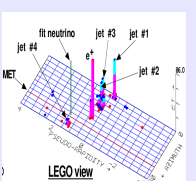
Top Mass Measurement Using The Template method



Lina Galtieri (LBL)

Method reported in the Evidence paper (PRD 50, 1994) and the Discovery paper (PRL 74, 1995)

Event detected September 24, 1992

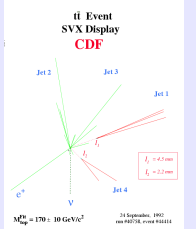
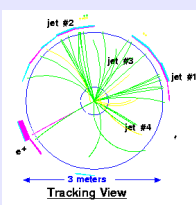


good top candidate
 $t\bar{t} \rightarrow W^+ b W^- b$
 $W^+ \rightarrow e^+ \nu$, $W^- \rightarrow \text{jet jet}$
2 b jets, tagged

Wouldn't it be nice to find a mass peak for top events?!

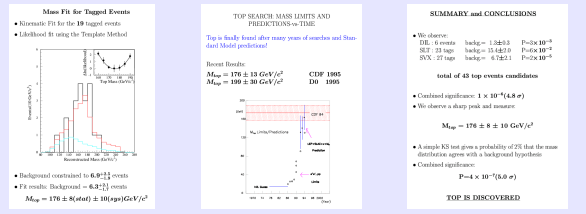
YES IT WOULD!!

Top of the world Everest 29035' (picture by LG, Oct. 1993)

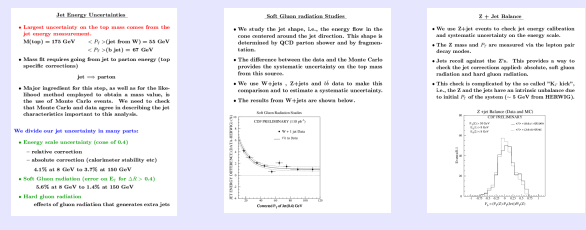


CDF Top Discovery mass measurement

(Slides from Top discovery talks by LG, spring 1995)



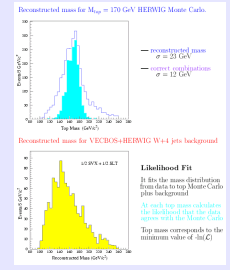
Systematic uncertainties (8.3/10 GeV) due to jet energy uncertainties. (Talk at Moriond 1996)



Template Method (LBL talk by LG, April 26, 1994)

Mass Analysis. We fit the tagged leptons + jets events to the $t\bar{t}$ hypothesis, using a constrained linear fit...

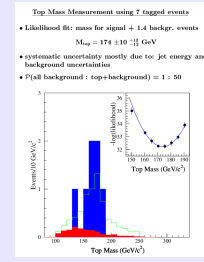
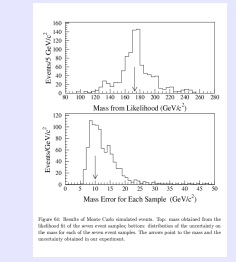
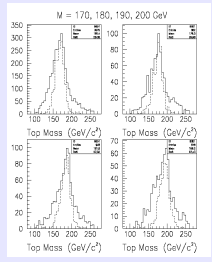
jet energies are corrected - for detector effects - for differences among quark types in $t\bar{t}$ events...



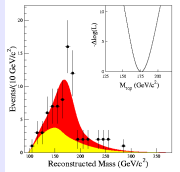
Sample Templates

Pseudo-experiments

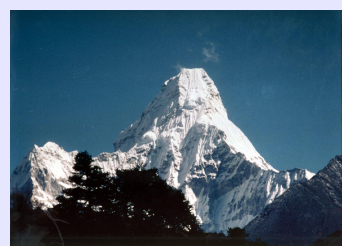
Run IA top mass



Run I final, lepton+jets

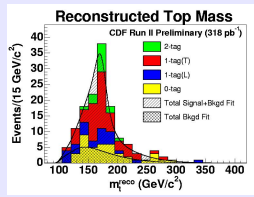


OOPS! Peak looks more like Ama Dablang!



Run II, lepton+jets

Enhanced 2D fit, Improved jet systematics



(picture by LG, Oct. 1993) CDF Top Mass results using the Template method

tagged events	M_{top} GeV/c ²	jet syst. GeV/c ²	data	Reference
7	174±17	8.3	run IA	PRD 50/94
19	176±13	8.3	run I	PRL 74/95
34	176.1±6.6	5.1	end run I	PRD 63/01
63	173.5±3.9	2.8	run II	summer '05



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