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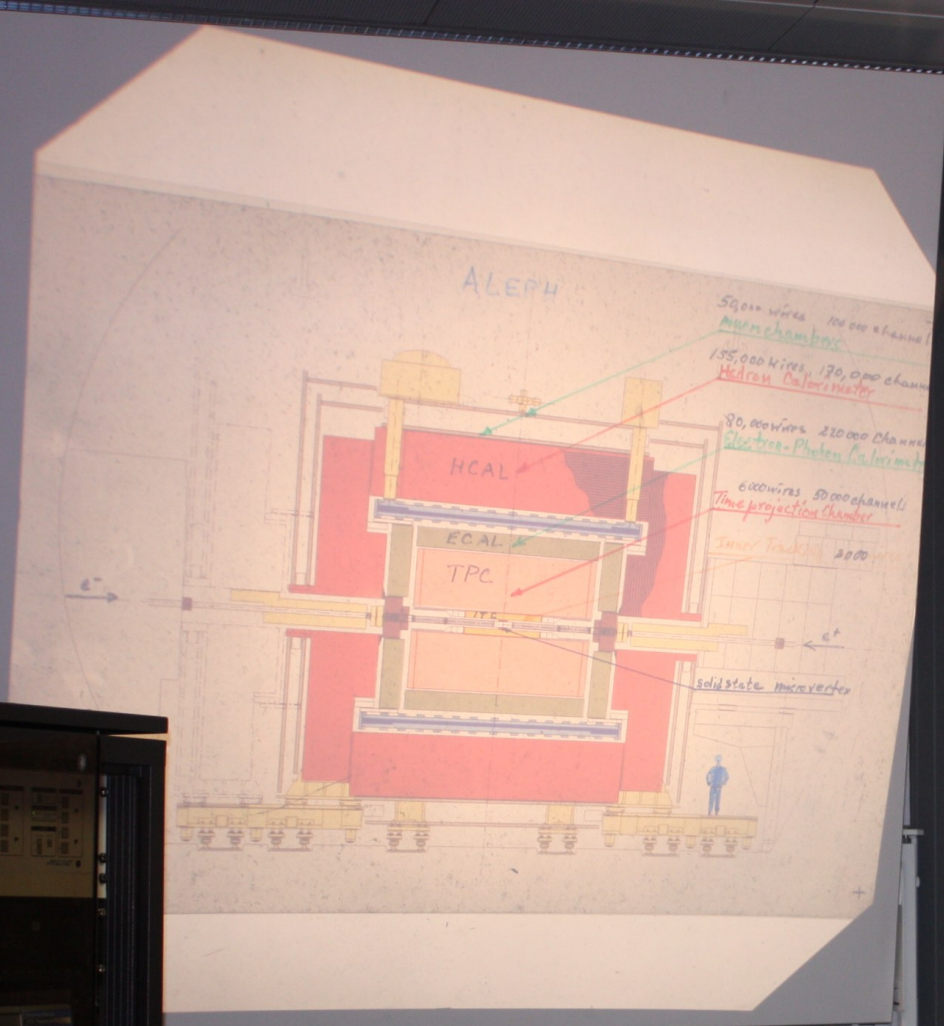
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Volume 11, number 4 PHYSICLETTERS B

DETERMINATION OF THE NUMBER OF LIGHT NEUTRINO SPECIES

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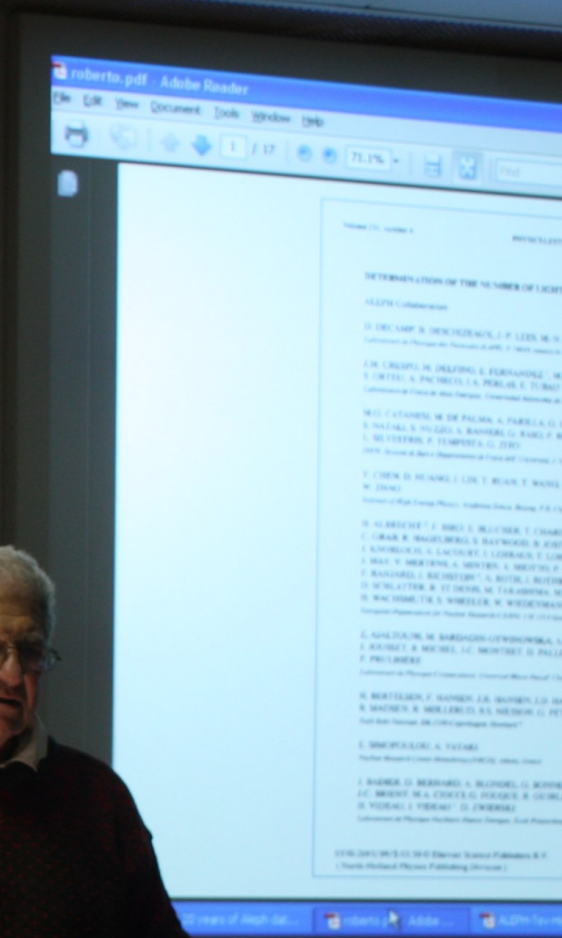
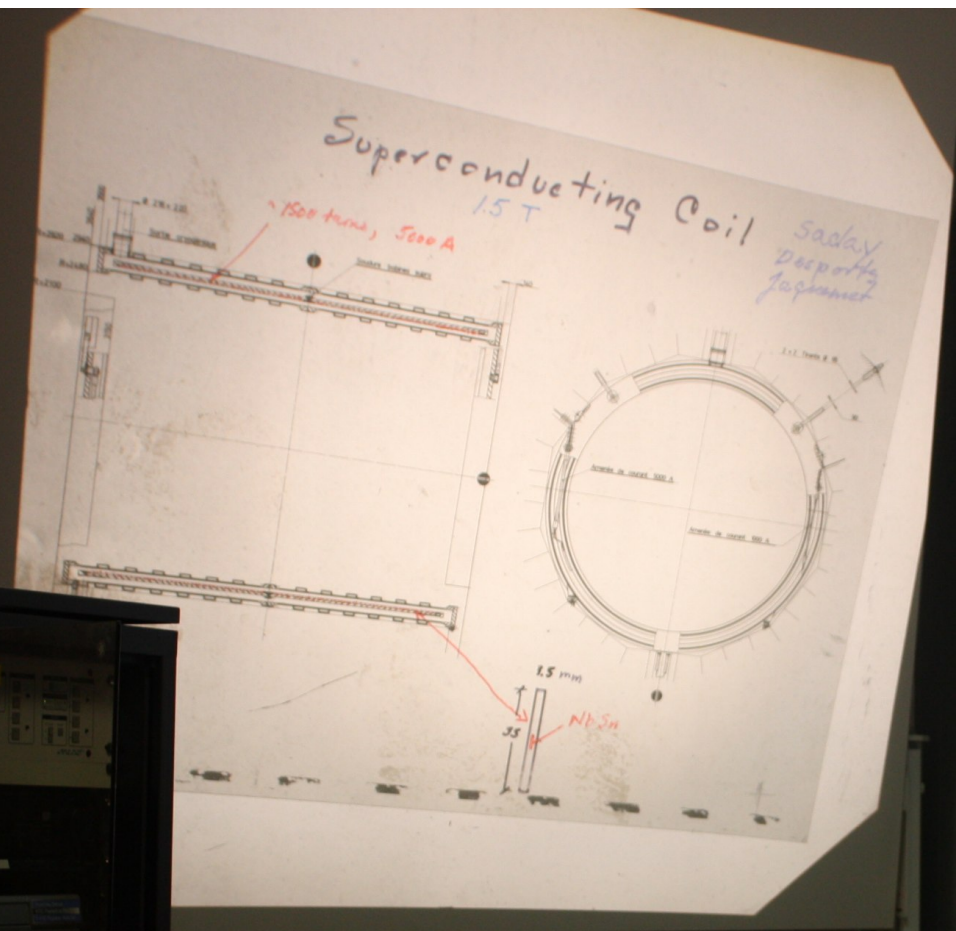
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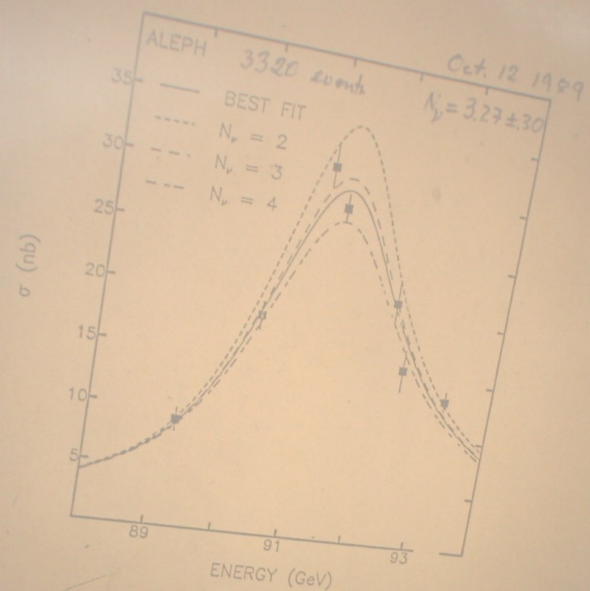
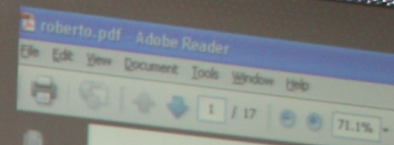


Figure 5: The cross-section for  $e^+e^- \rightarrow \text{hadrons}$  as a function of centre-of-mass  $e^+e^-$  energy and result of the three parameter fit.

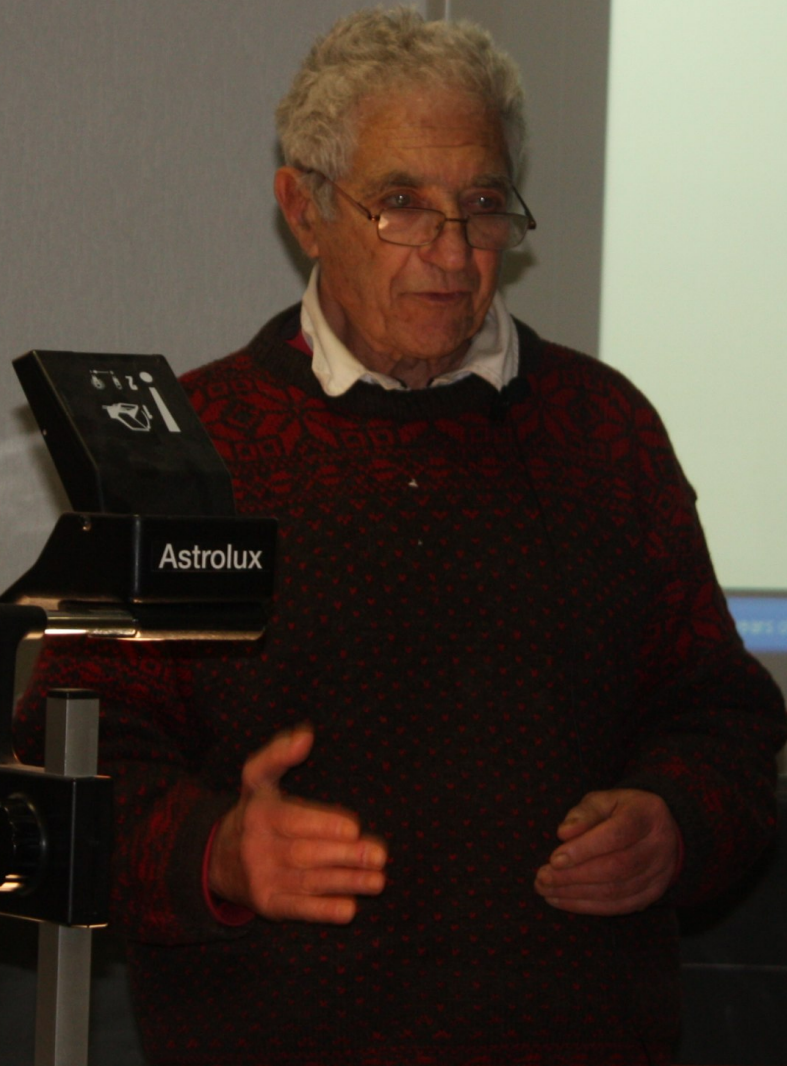
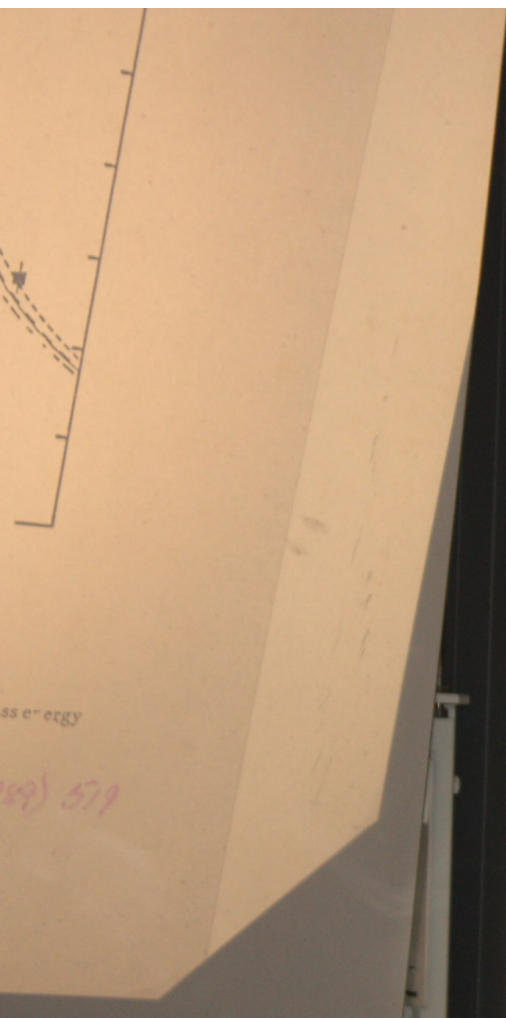
ALEPH, D. Decamp et al. PLB 231 (1989) 511



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# Startup year, 1989

First beam  
First physics

July 14<sup>th</sup>  
August 14<sup>th</sup>

55 days scheduled for physics  
 • peak luminosity  $4.3 \cdot 10^{30} \text{ cm}^{-2} \text{ s}^{-1}$   
 • best day  $64 \text{ nb}^{-1}$   
 • **integrated luminosity  $1.7 \text{ pb}^{-1}$**

Turn around time > coast length

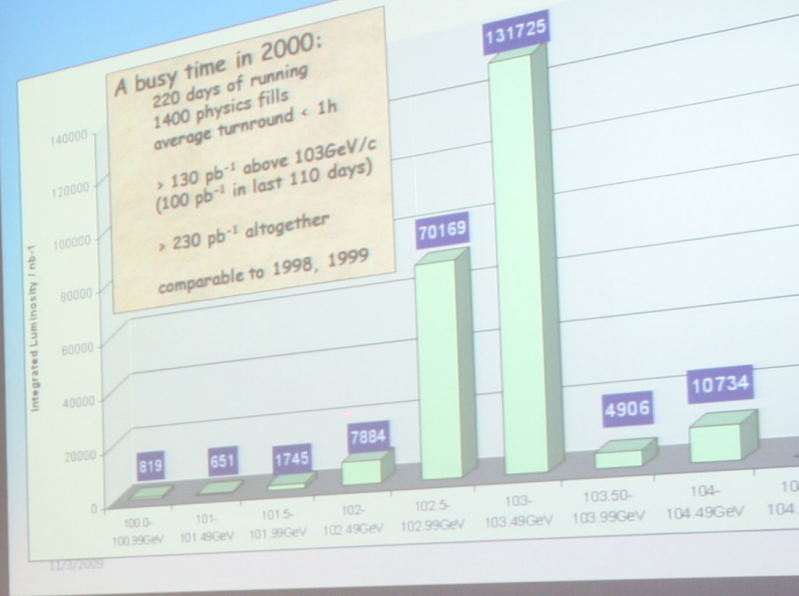
LEP discovered:  
 • only three families

		1989	
Total hours scheduled	Hrs.	3107	
Sched. hours for commissioning	"	1284	
Scheduled hours for setting-up	"	454	
" hours for MD	"	1321	
" hours for physics	"	459	
Beam in coast	%	35	
Efficiency			
		peak	avg.
Max. current at injection	nA.	2.85	2.2
Colliding intensity	nA.	2.64	1.86
Initial luminosity	$\text{cm}^{-2} \text{ s}^{-1}$	$10^{30}$	4.25
Best luminosity	$\text{cm}^{-2} \text{ s}^{-1}$	$10^{30}$	
Integrated luminosity	$\text{pb}^{-1}$		1.74
Beta at the experiments (v)	cm	7	
Turn around time	hrs.	0.50	7.35
On Coast duration	hrs.	12.45	5.00
Total number of coasts		97	
Lost coasts percentage	%	35	



2000

A busy time in 2000:  
220 days of running  
1400 physics fills  
average turnaround < 1h  
> 130 pb<sup>-1</sup> above 103GeV/c  
(100 pb<sup>-1</sup> in last 110 days)  
> 230 pb<sup>-1</sup> altogether  
comparable to 1998, 1999



Man in white shirt presenting.

Blackboard with faint writing.







# Outline

- Introduction
  - Higgs, Tevatron
- Standard Model (SM) Higgs
  - Analysis Strategy
  - Low Mass
  - High Mass
  - Combination
- Non-SM Higgs
  - Neutral MSSM
- Prospects & Conclusions

Fermilab  $p\bar{p}$  Tevatron Collider

ALEPH: 20 years of data

2









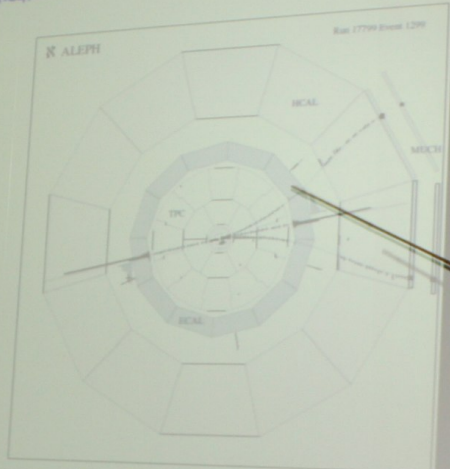






# Not all detectors are suitable for particle flow

- Indeed, ALEPH was the prototype of such detector
  - Excellent muon and electron identification
  - ECAL longitudinal segmentation
  - ECAL transverse granularity
  - Tracking in TPC and HCAL
  - Muon chambers

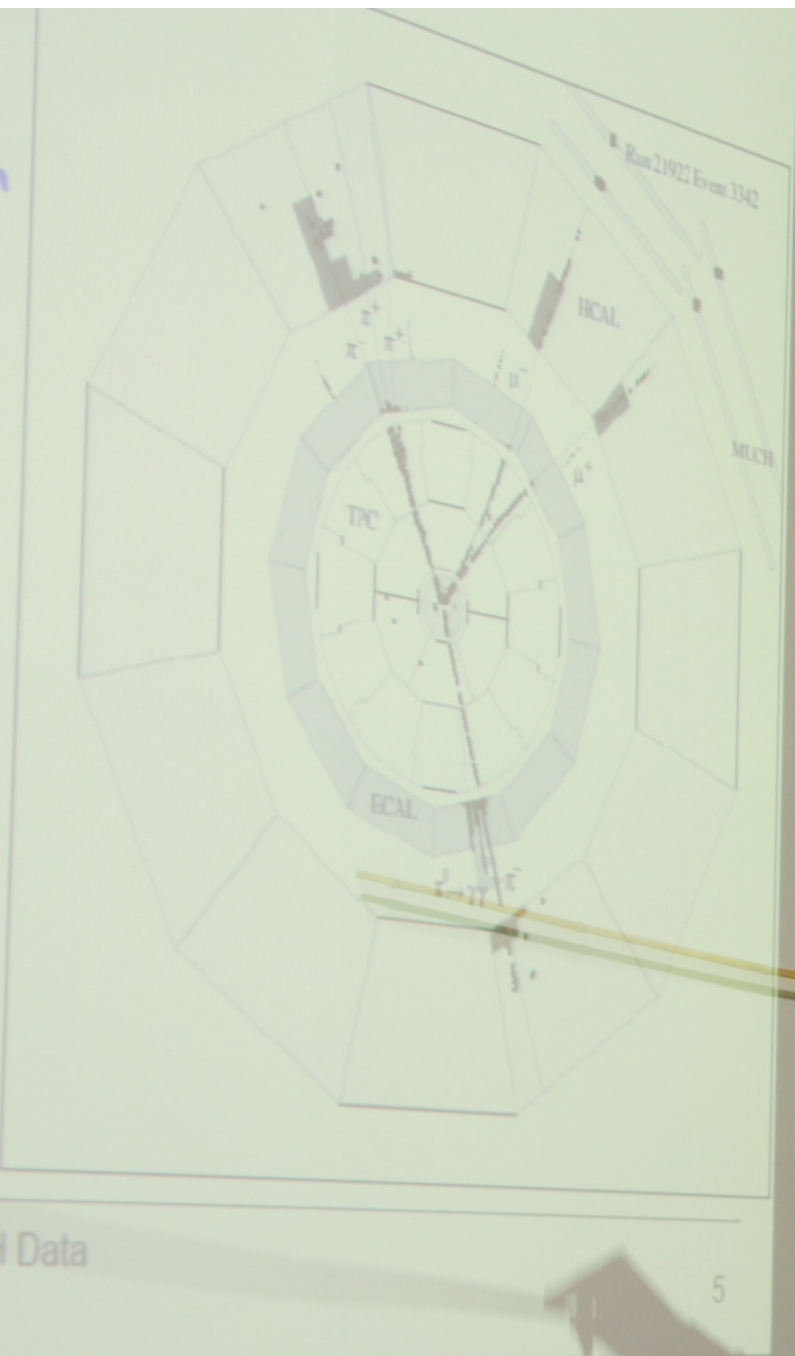


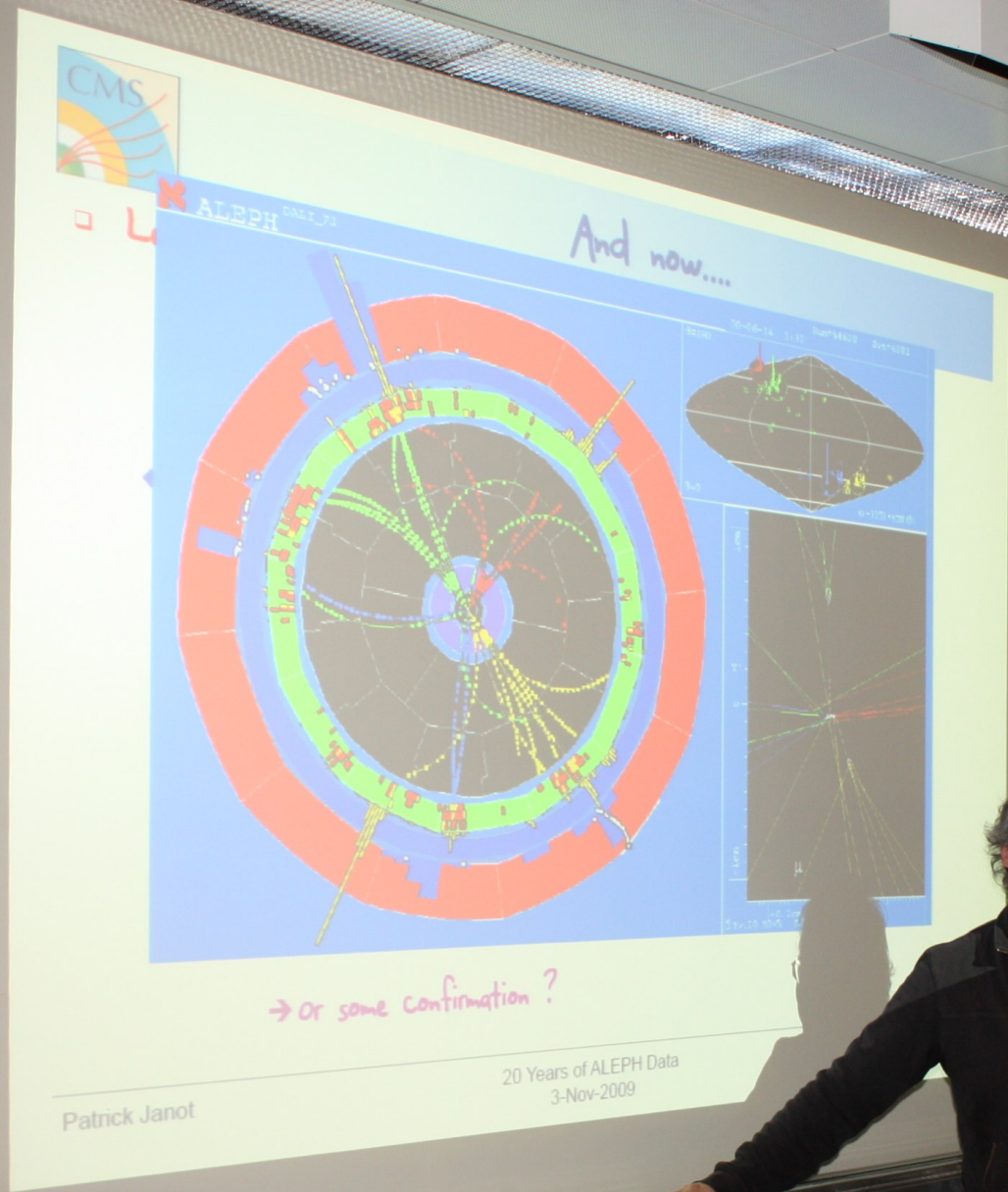
$$e^+e^- \rightarrow e^+e^-\mu^+\mu^-$$



20 Years of ALEPH Data  
3-Nov-2009







Patrick Janot

20 Years of ALEPH Data  
3-Nov-2009

→ or some confirmation?

$x_{52}$   $x_{28}$   $x_{FM}$   $x_{Dipol}$

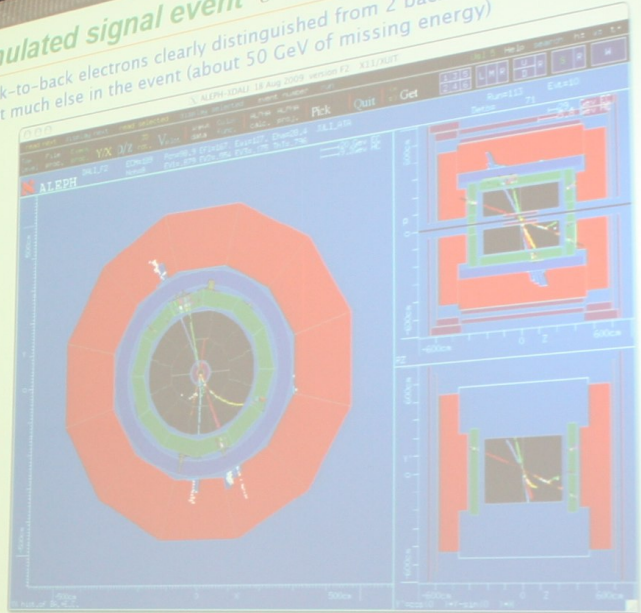




Kyle C



**Simulated signal event**  $e^+e^- \rightarrow ZH \rightarrow 2e4\tau$   
2 back-to-back electrons clearly distinguished from 2 back-to-back jets.  
not much else in the event (about 50 GeV of missing energy)



Kyle Cranmer (NYU)

20 years of ALEPH data, Nov. 3, 2009







































































































THE ALPHI EXPERIENCE

