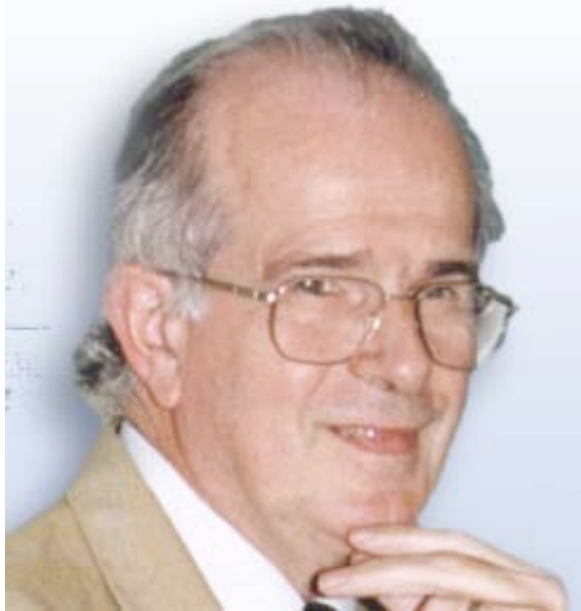


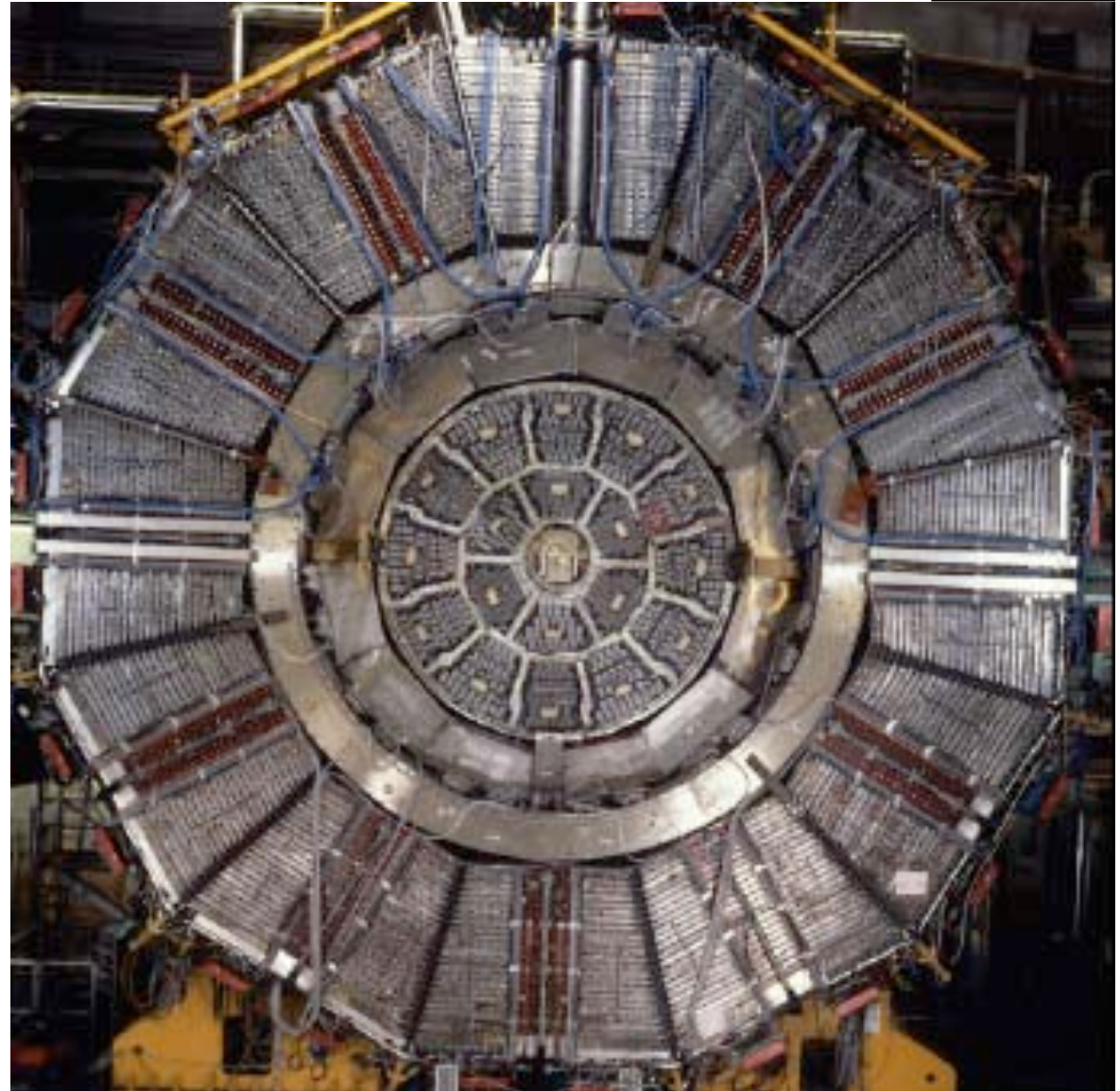
Jacques and ALEPH



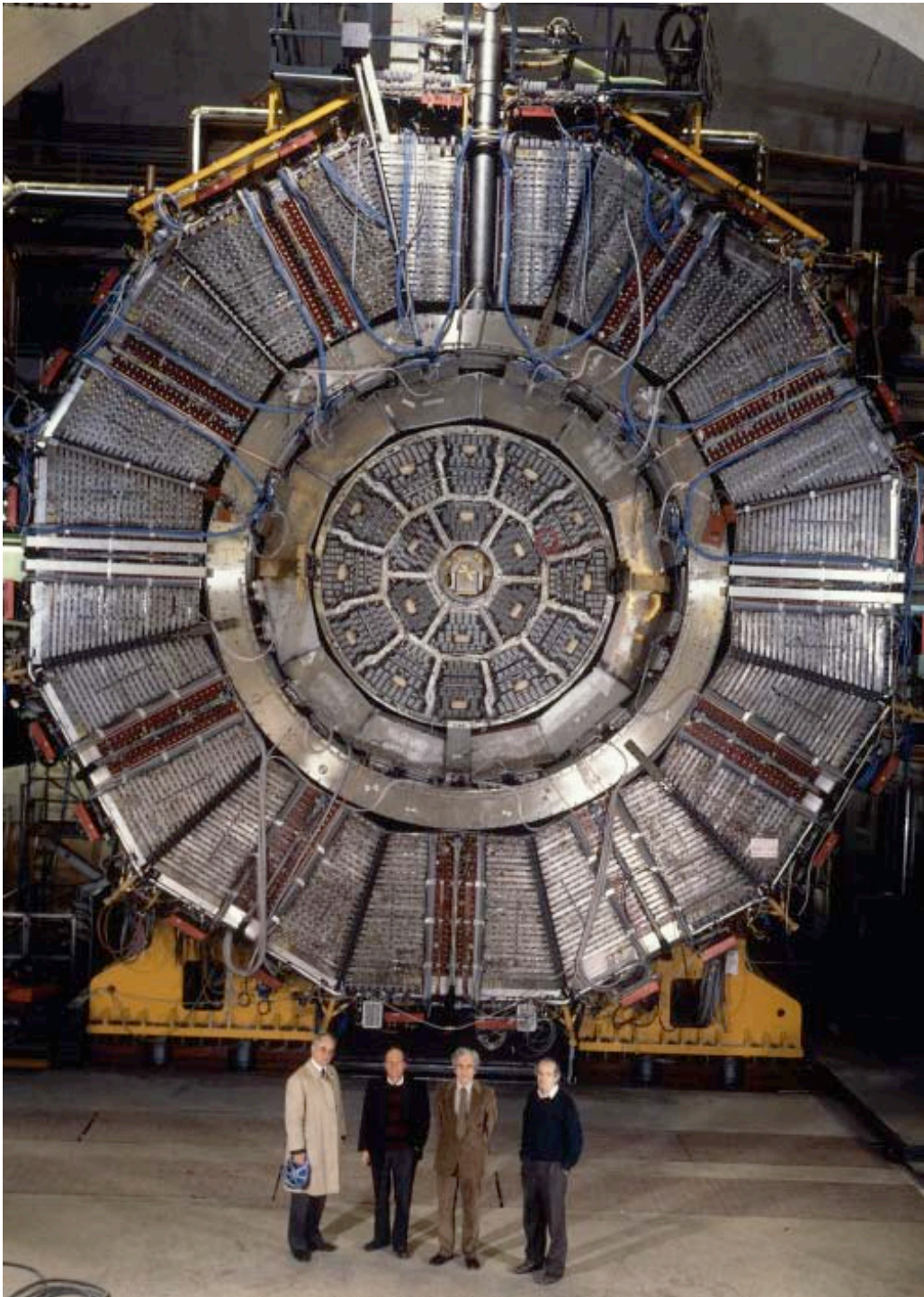
¿ El ALEPH? -repetí.

*Sí, el lugar donde enstán,
sin confundirse, todos los
lugares del orbe, vistos
desde todos los ángulos*

From *El Aleph*, J.L. Borges



Prix André Lagarrigue 2006



Aleph was a gifted Collaboration also because there were few high charismatic people capable to indicate the direction of the path to the success of the experiment and to inspire the young fellows.

Jacques was one of those people.

Brief history of ALEPH and Jacques



- The Collaboration was initiated in 1980 and is still producing papers.
- More than 30 institutions from western Europe, USA and China
- Took data at LEP from 1989 to 2000
- Produced some 300 papers, 21 with more than 100 citations

Jacques was among the initiator of ALEPH, he inspired the design of its electromagnetic calorimeter and directed its construction, in ALEPH he served as Spokesman, Chair of the Institution Board and Chair of the Editorial board.

Discussion on
LEP Physics

9/7/1980

Representatives from the following institutions agreed to take part in this meeting: CERN (May, Steinberger, Wahl), Dortmund (Eisele, Kleinknecht), Heidelberg (Dydak, Geweniger, Kluge Tittel), MPI München (Blum, Lorenz), Orsay (Davier, Lefrançois) Pisa (Bellettini, Foa), and Saclay (Rander, Turlay).

81 – ECAL conception

H. Videau and J. Lefrancois

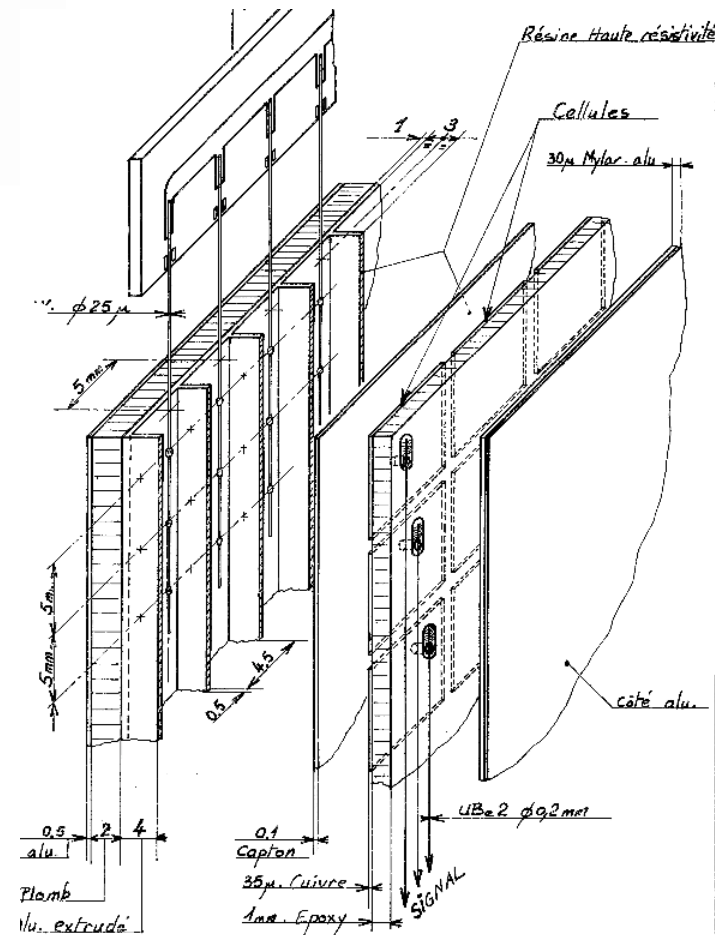
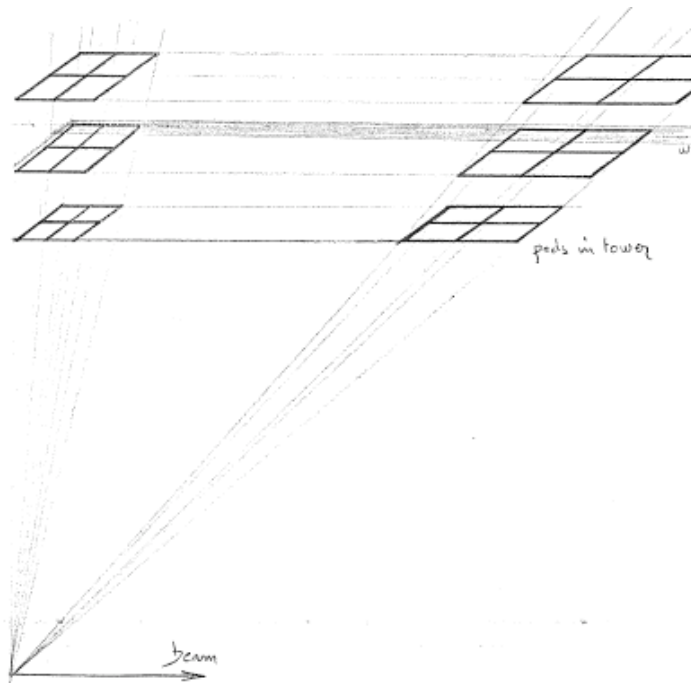
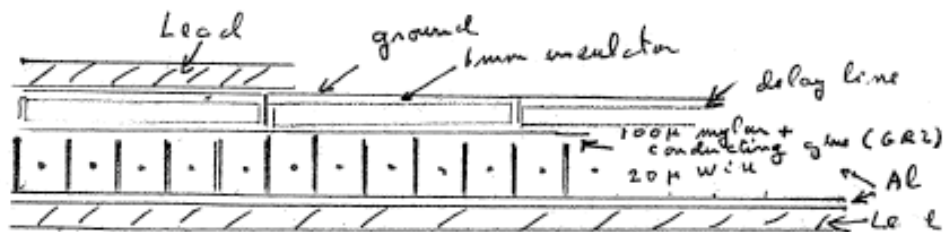
April 23rd, 1981



Lep Note # 38

WIRE CHAMBER e- γ DETECTOR

Fig. 4 Delayline read-out



81 – ECAL test beam at SLAC



Prix André Lagarrigue 2006

82: Letter of Intent



| <u>A L E P H</u> | | |
|---|---|----------|
| <u>List of participating institutes</u> | | |
| Bari |] | Italy |
| Pisa | | |
| Torino | | |
| Trieste | | |
| Damokritos |] | Greece |
| Dortmund | | |
| Heidelberg |] | GERMANY |
| MPI München | | |
| Edinburgh |] | U. K. |
| Glasgow | | |
| Lancaster | | |
| Rutherford | | |
| Sheffield | | |
| Westfield College | | |
| E. P. Palaiseau |] | France |
| Orsay | | |
| Saclay | | |
| Wisconsin |] | U. S. A. |
| CERN | | |

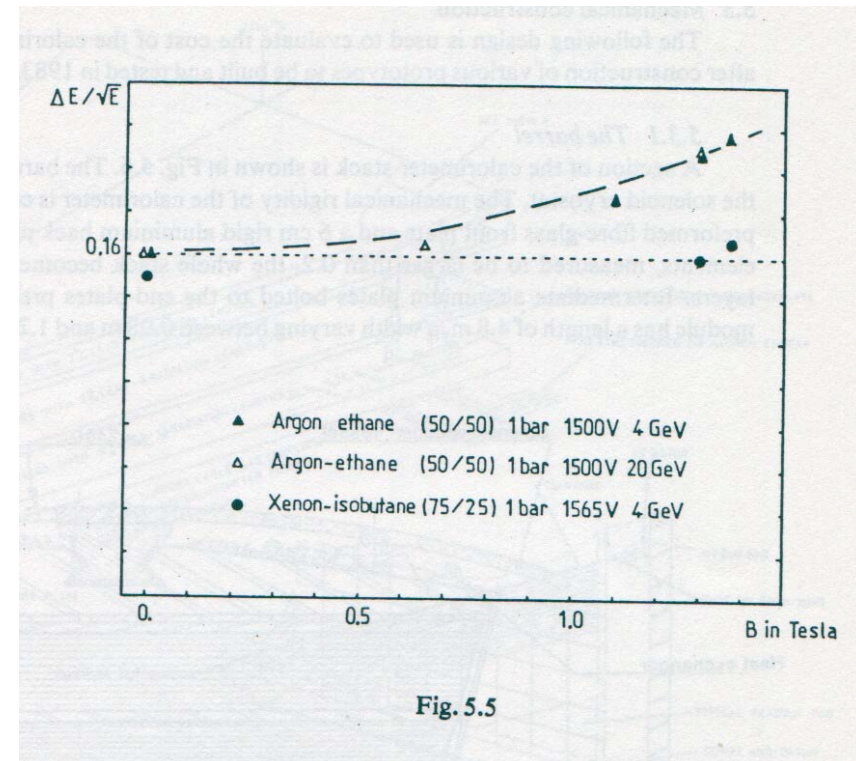
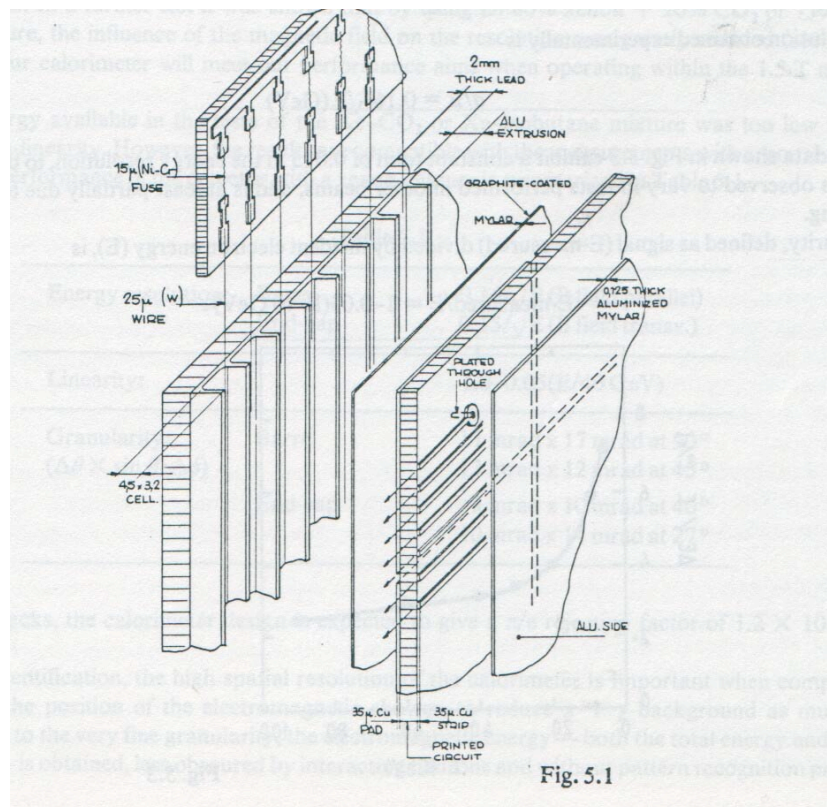
First transparency of Jacques' presentation of the ALEPH letter of intent to the LEPC in spring 1982 .

The transparency was written in powerpoint 0.0

83: Technical Report



Various criteria can be used to choose between different designs for an electromagnetic calorimeter. We have decided to emphasize granularity....it simplifies the identification of electrons in hadronic jets and facilitates the separation of photon energy from the background produced by interacting hadrons.....



83 – Preparing for construction



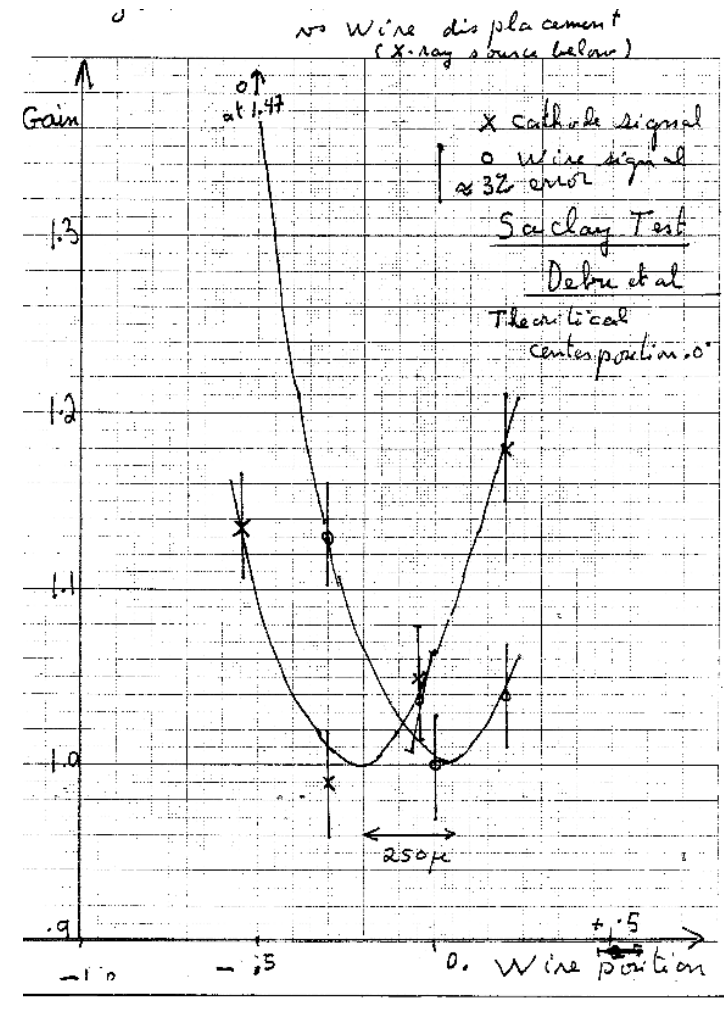
Orsay, May 9, 1983

ALEPH note 102

UNIFORMITY AND STABILITY OF THE e/γ CALORIMETER

J. LEFRANÇOIS - J. RANDER

The vertical (toward the pads)
displacement of the wires



83–89 The years of ECAL construction



“Nothing had been done before on this scale at Ecole Polytechnique or Orsay. We had to recruit personnel for the repetitive labour...Most important was the development of a large number of machines for production and quality control. Finally the stacking of chambers and lead sheets was done in Saclay and Orsay... we had to connect 2 million pads from the 48000 towers.... We inserted the modules in the solenoid in 1988 and 1989.... After some initial difficulties in August 89, the modules worked very well for 12 years”.

J. Lefrancois “The Aleph experience”

ALEPH ECAL BARREL:

Clermont -Ferrand

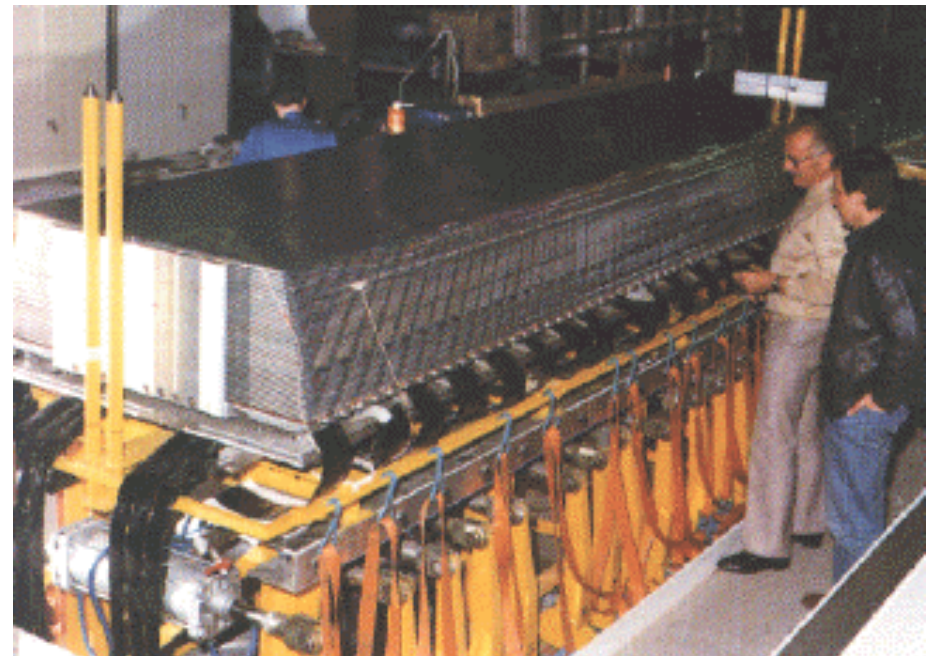
Ecole Politechnique

Marseille

Orsay

Saclay

Prix André Lagarrigue 2006



But also physics preparation and Aleph weeks



1986



But also physics preparation and Aleph weeks

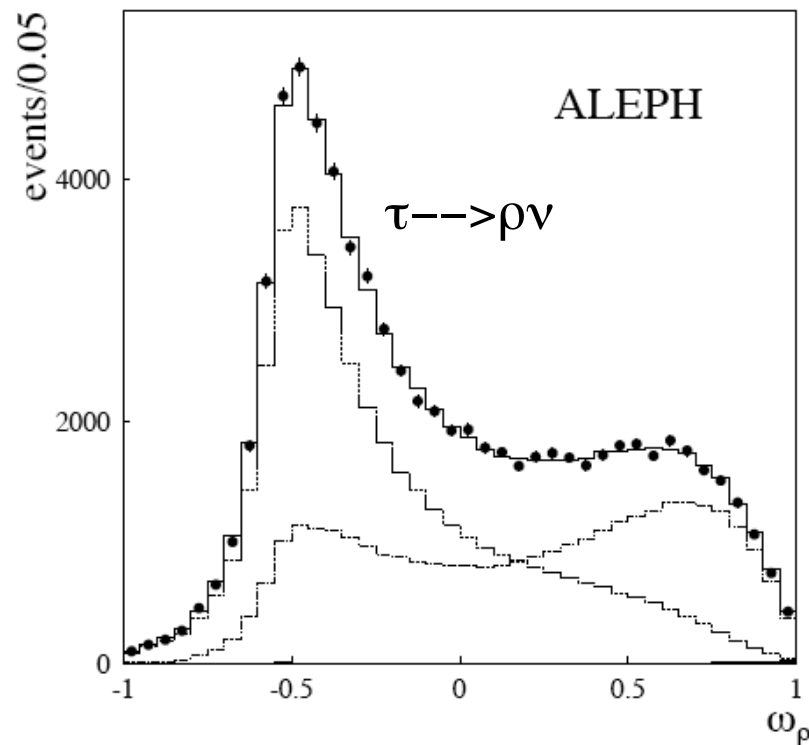


ALEPH week in Barcelona 1988 . Jacques is asked (because he likes...) to thank Enrique Fernandez at the gala dinner.

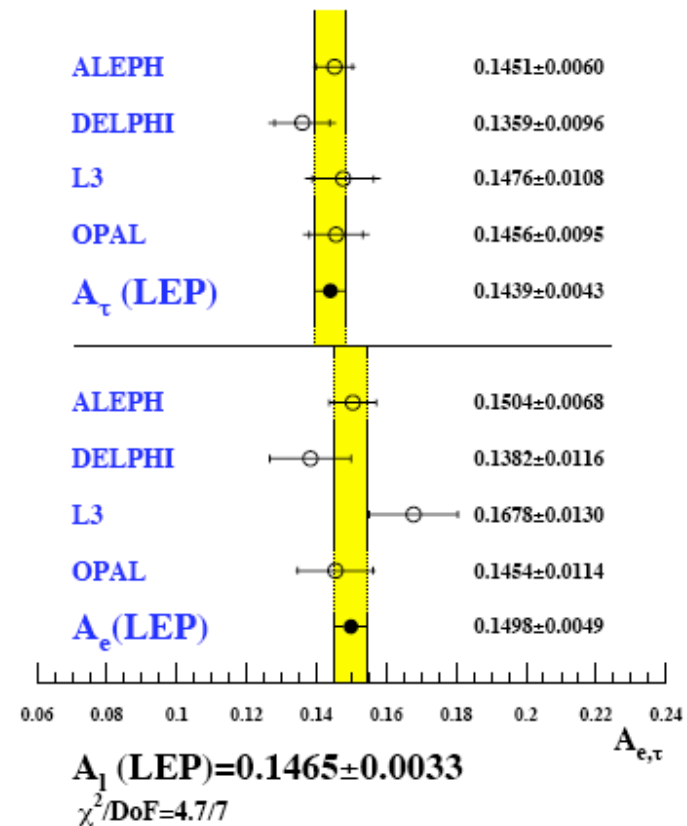
The great ALEPH ECAL: τ physics



The decision made in ALEPH was to deliberately choose in favour of a (calorimeter with) good granularity, mostly on arguments of particle identifications in b jets. This choice turned out to be crucial for τ physics: it is the primary reason for the often-noted leading position of ALEPH in the field. M. Davier “The ALEPH experience”.



Prix André Lagarrigue 2006

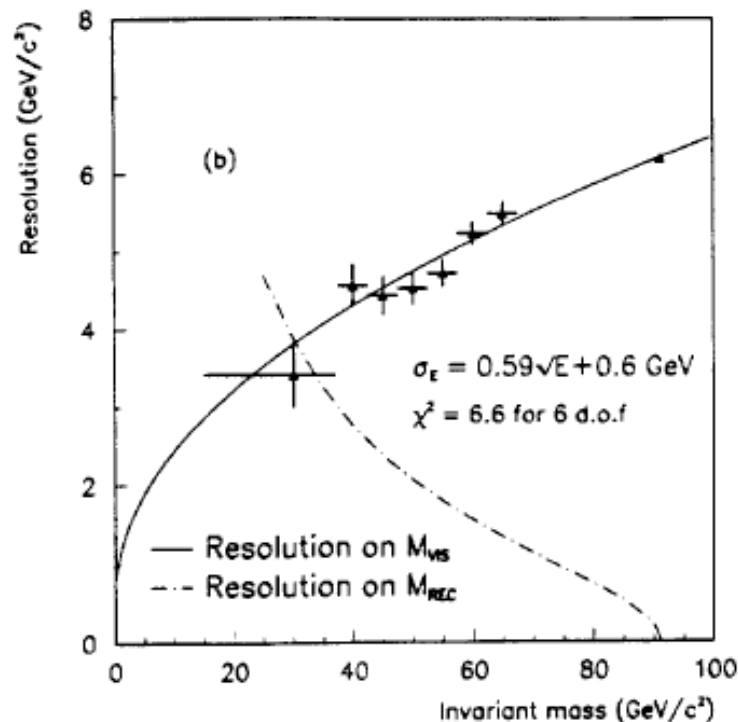


The great ALEPH ECAL: ENERGY FLOW



The “Energy Flow” philosophy started with the design of ECAL that was purposely designed to emphasize the granularity over the energy resolution and the redundancy over the ultimate precision....

Energy Flow has been the basis of most of the ALEPH analyses and success from May 1990 onward..... P. Janot: “The ALEPH experience”.



Summing Calorimeter Cells

$$\sigma(E)/E = 1.2 / \sqrt{E/\text{GeV}}$$

With Energy Flow

$$\sigma(E)/E = 0.6 / \sqrt{E/\text{GeV}}$$

LEP Inauguration party July 1989



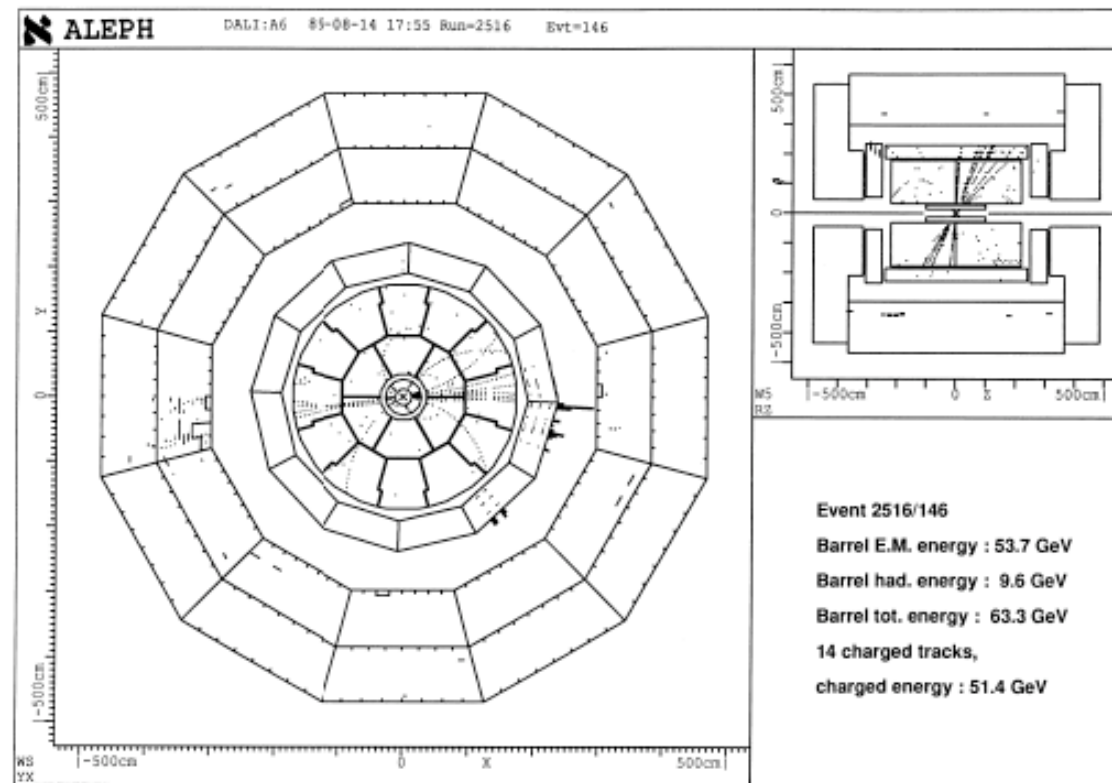
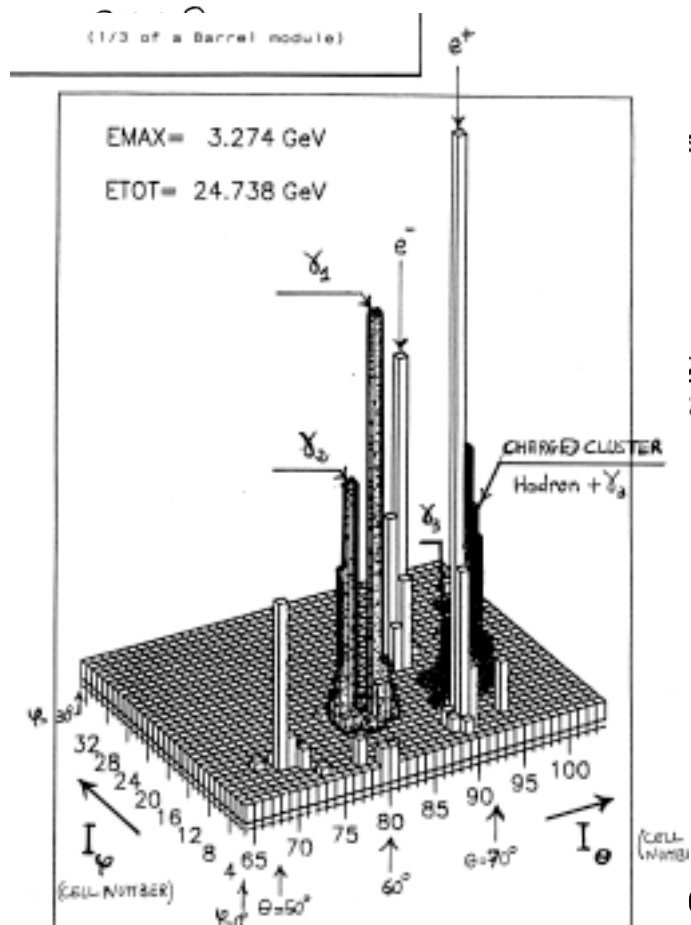
Prix André Lagarrigue 2006

The Pilot Run 13-18/8/1989



“ECAL had severe problems in the readout software...ECAL had also some sick multiplexer cards that were faking high energy deposit in the calorimeter...the data had to be cleaned with an offline procedure....”

Aleph note 89-143



90 – The first paper on $Z \rightarrow$ leptons



Volume 234, number 3

PHYSICS LETTERS B

11 January 1990

DETERMINATION OF THE LEPTONIC BRANCHING RATIOS OF THE Z

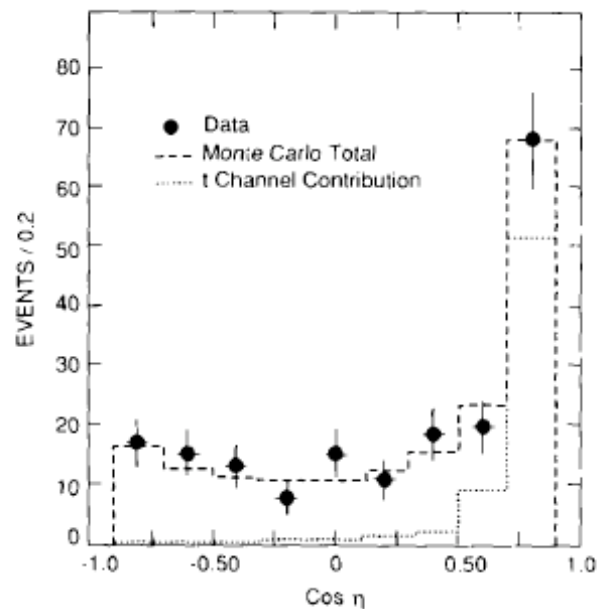
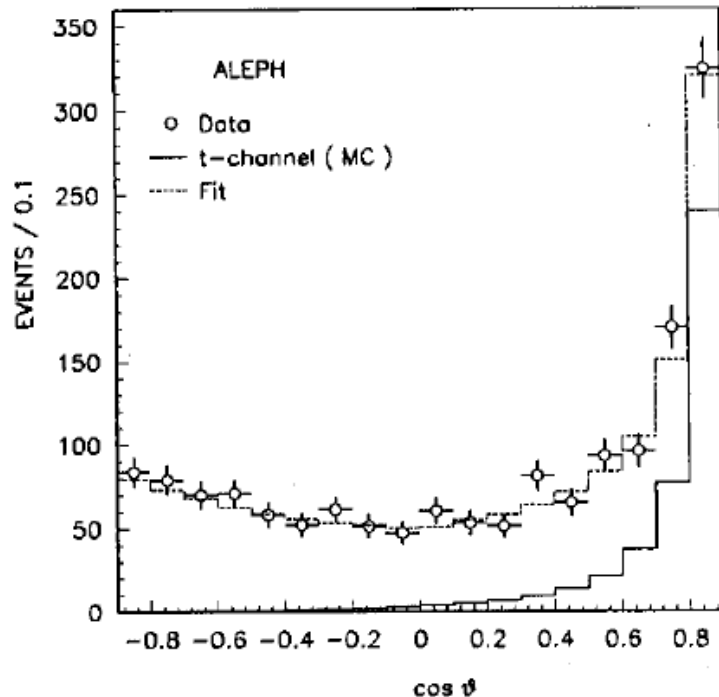


Fig. 2. The angular distribution for $e^+e^- \rightarrow e^+e^-$ showing the t channel peak in the forward direction.

...and the t -channel subtraction.

“The t channel cross section was evaluated by first generating e^+e^- and $\mu^+\mu^-$ events with BABMC and MUONMC...The MC are first order generators...the final correction was 15.3% with interference effects contributing only 1.5%. The systematic error t channel subtraction (1.5%)”

90 – Second electroweak paper



...since no generator exists which handles $O(\alpha^2)$ radiative corrections the cross section has been computed using the formulae of Greco as implemented in a program by Caffo and Remiddi. The conclusion is that an error of 3% should be ascribed to the t-channel subtraction.... The overall systematic uncertainty from the t-channel subtraction is 0.5%.

9 1 – The third electroweak paper



ALEPH 90-173
PHYSIC 90-101
J. Lefrançois, H. Seywerd
7.12.1990

Acceptance for Bhabhas and the t-channel Problem

J. Lefrançois and H.C.J. Seywerd

6 December 1990

At peak energy uncertainties in ALIBABA result in a systematic error of 2% of the pure t-channel part of the subtracted cross section. The uncertainty in the value of $\sqrt{s-M_Z}$ gives an additional 1.6% of the subtracted cross section in the angular range

$-0.9 < \cos\theta^* < +0.7 \dots \dots 0.4\%$

91 – The third electroweak paper

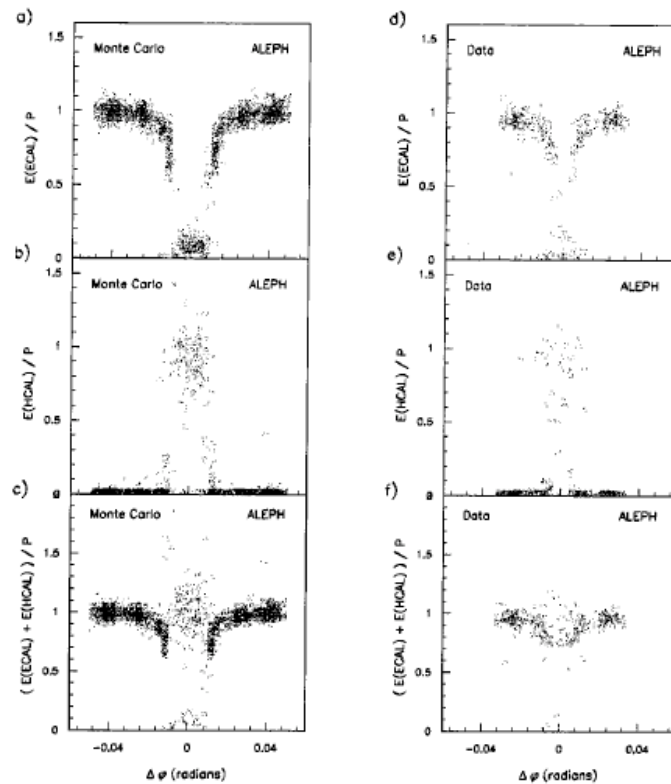
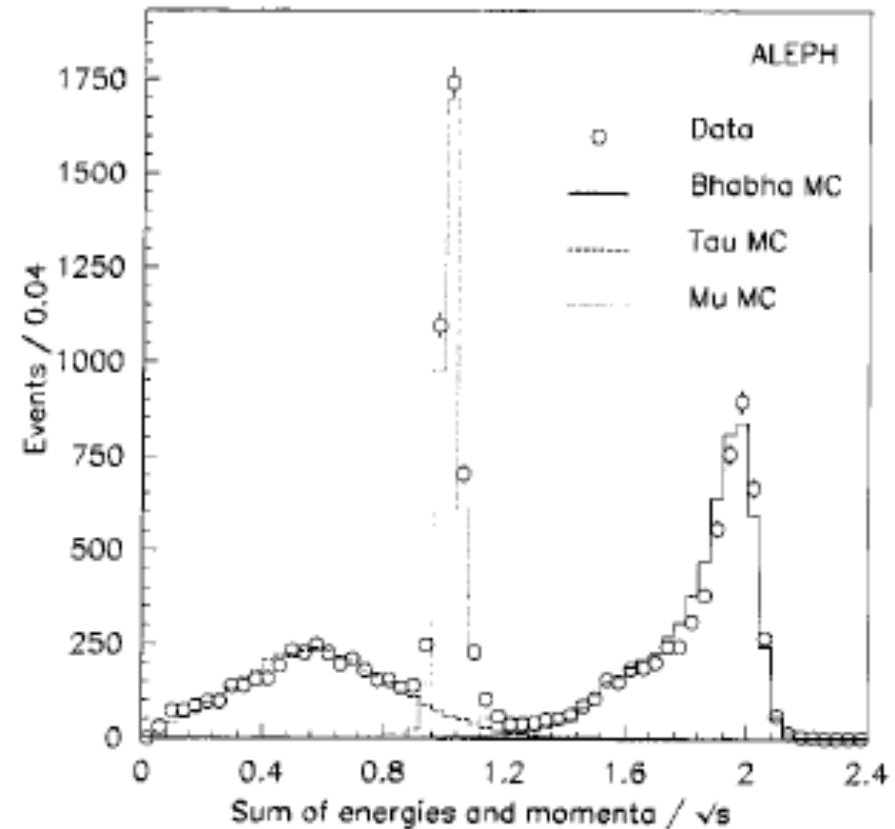


Figure 3: a) ECAL barrel energy versus azimuth $\Delta\varphi$, the distance to the crack, for Bhabha candidates, b) HCAL barrel energy versus azimuth $\Delta\varphi$ for Bhabha candidates, c) the sum of a) and b), for Monte Carlo; d), e) and f) are the equivalent plots for data. The modules in φ have been plotted together and only the part of the φ range around the crack regions is shown.

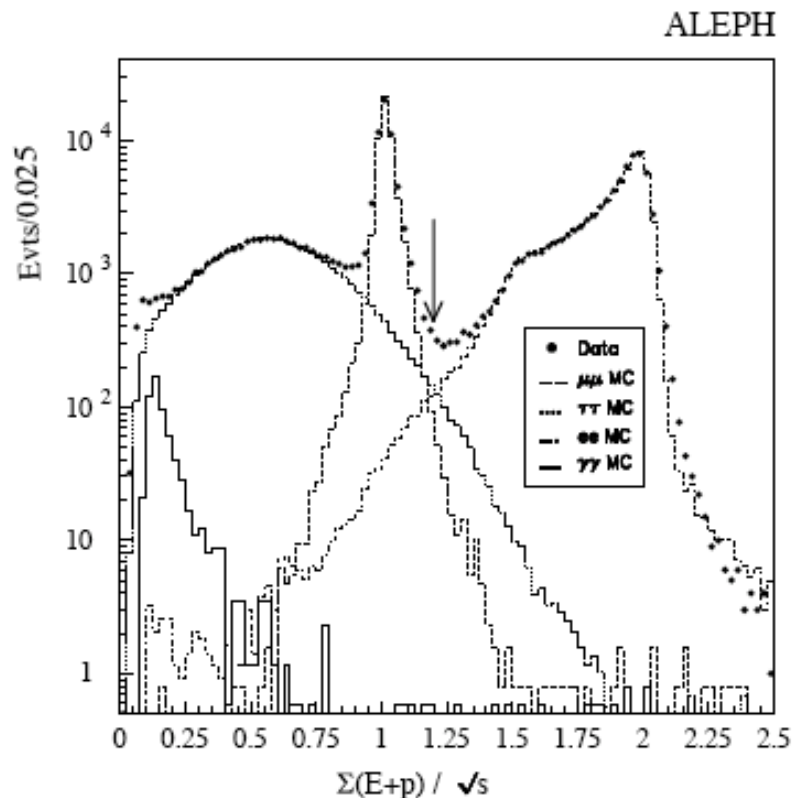


9 1 – ALEPH week in Paris



Prix André Lagarrigue 2006

99 – The last Electroweak paper



The theoretical treatment of the t channel is based on the semi-analytical program ALISTAR which allows the cross section to be calculated in $\cos\theta^*$ To have an accuracy of 0.1% one must subtract the t-channel with 1% precision.....

At the peak the total error is 1.2pb and represents 0.11% of the s-channel cross section....

96 – Pierre's farewell party



Prix André Lagarrigue 2006

... all nice stories have an end



.... also ALEPH....

.....but memories stays forever in
our heart.....

As those of the young physicists
who were attending one of their
first ALEPH meeting 25 years ago
and were looking at Jacques with
scientific respect and with the
dream to be like him in the future.

Prix André Lagarrigue 2006

