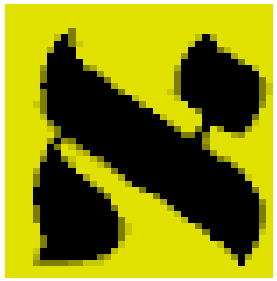


Laboratoire de l'Accélérateur Linéaire (IN2P3-CNRS) Orsay, France

LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE

Olivier Callot

7 September 1999

ALEPH status report

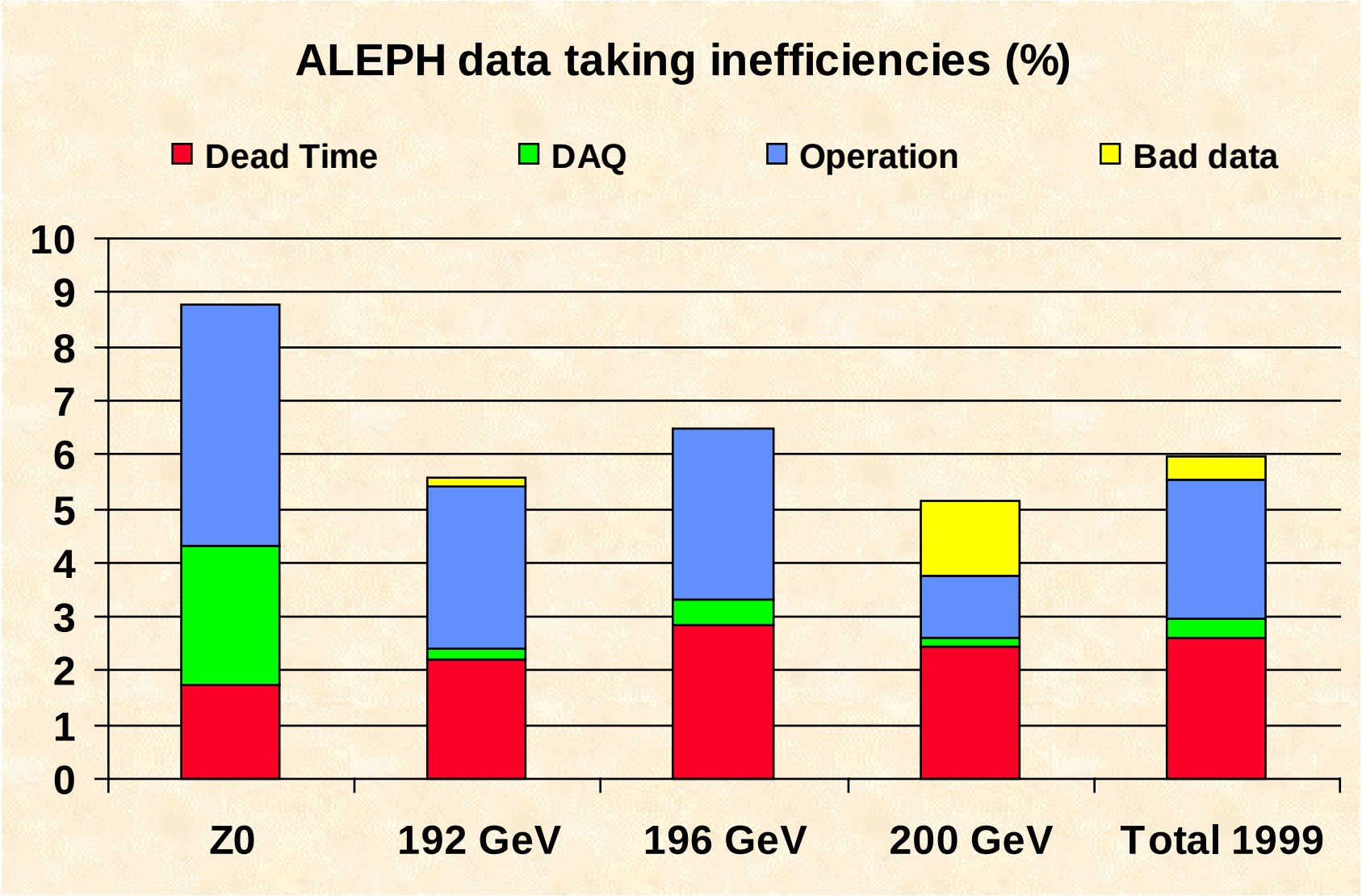
- Status of the run
  - Performance
  - Problems
- Requests for the end of 1999
- Analysis after LEP has shut down

Performance

- **LEP performance is (once again) fabulous**
  - **Very smooth startup**
  - **Energy increased earlier that expected**
    - **196 GeV from June 8th. Even one fill on June 4th.**
    - **200 GeV from August 2nd. Infrequent need to go back to 196 GeV.**
  - **LEP delivers good luminosity at 200 GeV**
    - **50 pb^{-1} in 36 calendar days. Average 1.4 pb^{-1} / day**
  - **Background conditions are (usually) perfect.**

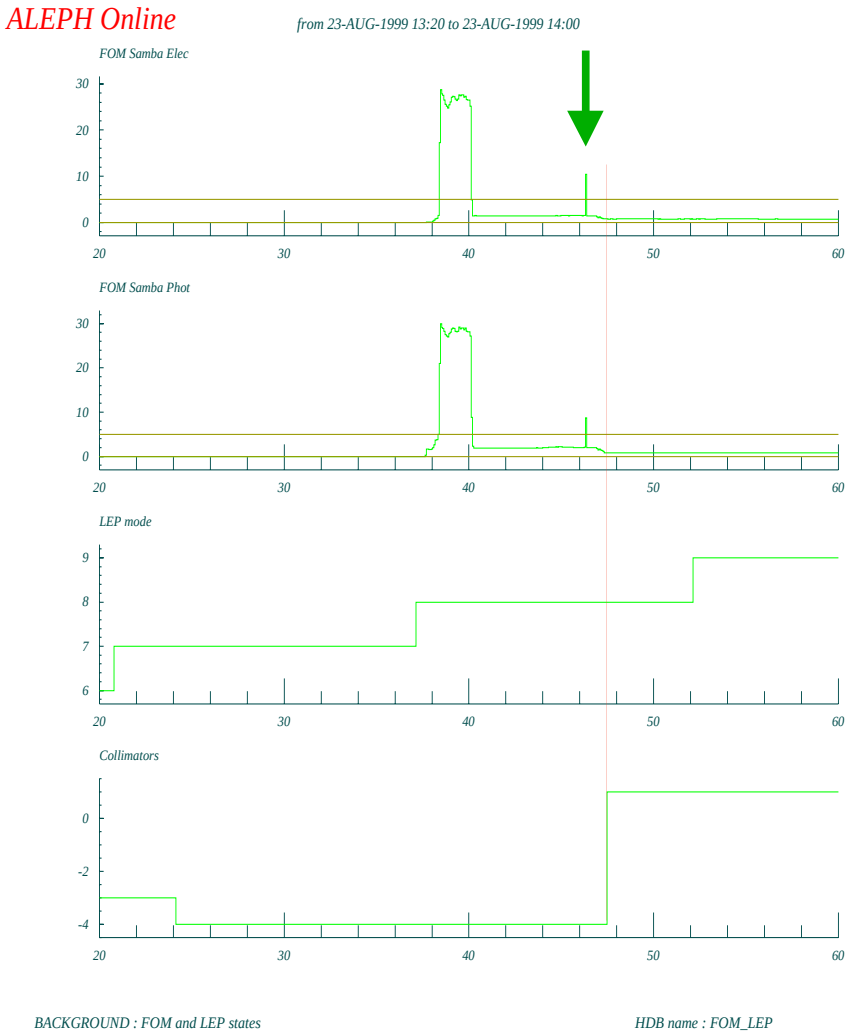
Congratulations and many thanks to the SL division

ALEPH performance is excellent



LEP background is VERY good, even before the collimators are moved IN.

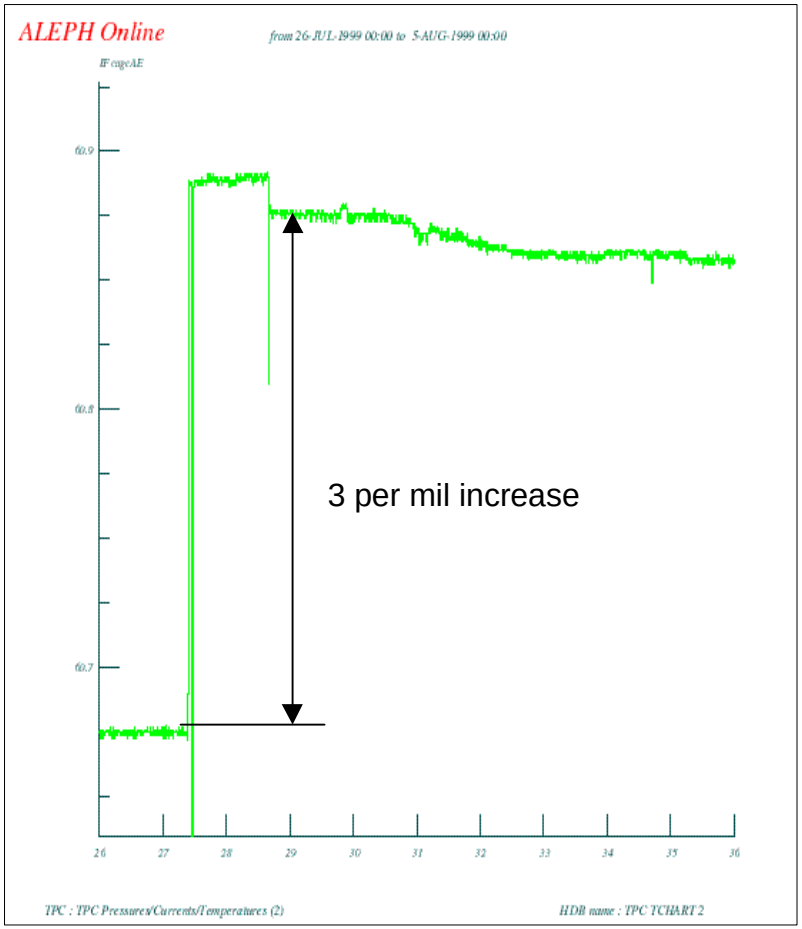
- Since August 12th, we turn ON after the "Tune Jump", detected by a background spike.
- HV is ON when the collimators are moved IN, and we start data taking BEFORE the Stable Beam indicator
- About 1% extra luminosity on tape, very low Operation inefficiency since then !



Problems

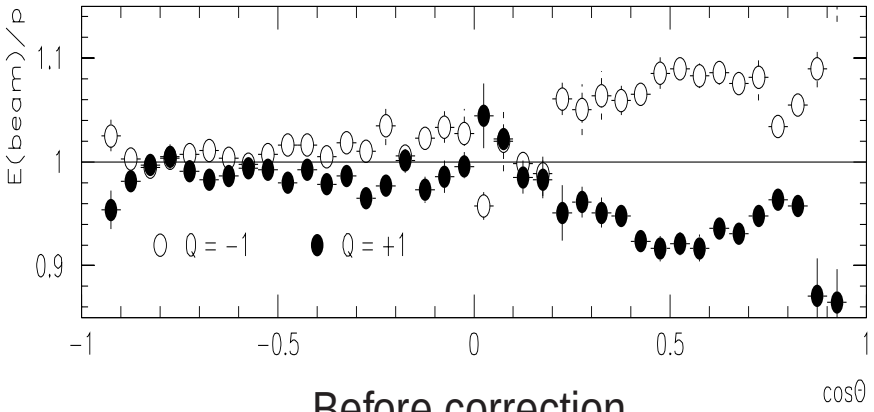
TPC short

- Severe beam loss on 27 July, 9:30
  - Due to SC quad trip in point 4
- TPC field cage current changed
  - Two rings of the cage shorted
  - Probably a carbon fiber as in 1992
- Need to localize the short to find the field map correction, and for that $Z^0 \Rightarrow \mu^+\mu^-$ events are needed.
- Data taken on 29-30 July, thanks to LEP and to the other collaborations

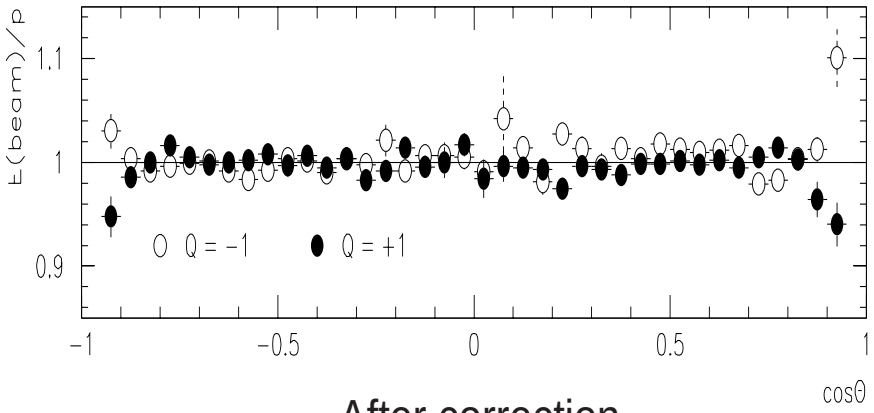


Momentum and impact parameter seriously affected

- **10 % effect on the momentum measurement. Opposite for Positive and Negative tracks. Only side A affected.**
- **Correction computed by using the position of the short and solving Maxwell's equation to describe the field.**
- **Correction available before 200 GeV data on 2 August, just one week-end after the data has been taken.**
- **Almost as good as before.**
- **Affected data, from July 27 to August 2, have already been reprocessed.**



Before correction.



After correction.

MAGNET

- **Several discharges for various reasons, not counting the ramps for polarization MD and one for the repair of a faulty UPS.**

Date	Reason	Loss
26 June 23:18	Power glitch	LEP waits
27 June 14:00	Temperature alarm on power supply	LEP waits
1 July 02:00	Power problem at point 6	No beam
7 July 08:30	Technical intervention on Micene.	No beam
12 July 14:00	Power glitch (?)	No beam
13 July 22:00	Abnormal flow on Feed-Through FT910	LEP waits, DELPHI off also.
15 July 18:51	FT910 again. => Threshold increased	615 nb-1 lost
29 July 18:57	UPS of gas safety chain dead	150 nb-1 lost (Z0 run)
24 August 10:10	Fault on cooling pump of the power supply	LEP waits

Other problems

- **Nothing very serious. Just ageing, and sometimes storms !**
  - **Fastbus power supplies to be replaced**
    Around 100 nb^{-1} lost
  - **Dead slow control crate.**
    Low voltage OFF on 3 TPC sectors, without warning.
    Data taken, but unusable for physics, 137 nb^{-1} lost.
  - **Network equipment fault.**
    No data lost.
- **Power cut on 26 August, due to transformer work at IP6**
  - **Several supplies and a few modules to be replaced.**
  - **Magnet was OFF…**
  - **Few faults appeared in the following days, probably related.**
    347 nb^{-1} of bad data due to TPC gating fault on 27 August.
    200 nb^{-1} lost due to HCAL HV supplies control problems.
  - **VDET common noise has actually improved afterwards !**

◆ Performance in numbers (up to fill 6286)

Energy	During Stable Beam			On Tape	
	Delivered pb-1	Collected pb-1	Efficiency %	Luminosity pb-1	Efficiency %
Z0	3.32	3.03	91.45	3.05	91.95
192 GeV	30.67	28.98	94.51	29.15	95.04
196 GeV	88.13	82.52	93.63	82.96	94.14
200 GeV	51.1	48.53	94.97	49.29	96.45
Total HE	169.88	160.02	94.19	161.39	95.01

+1.5 % extra

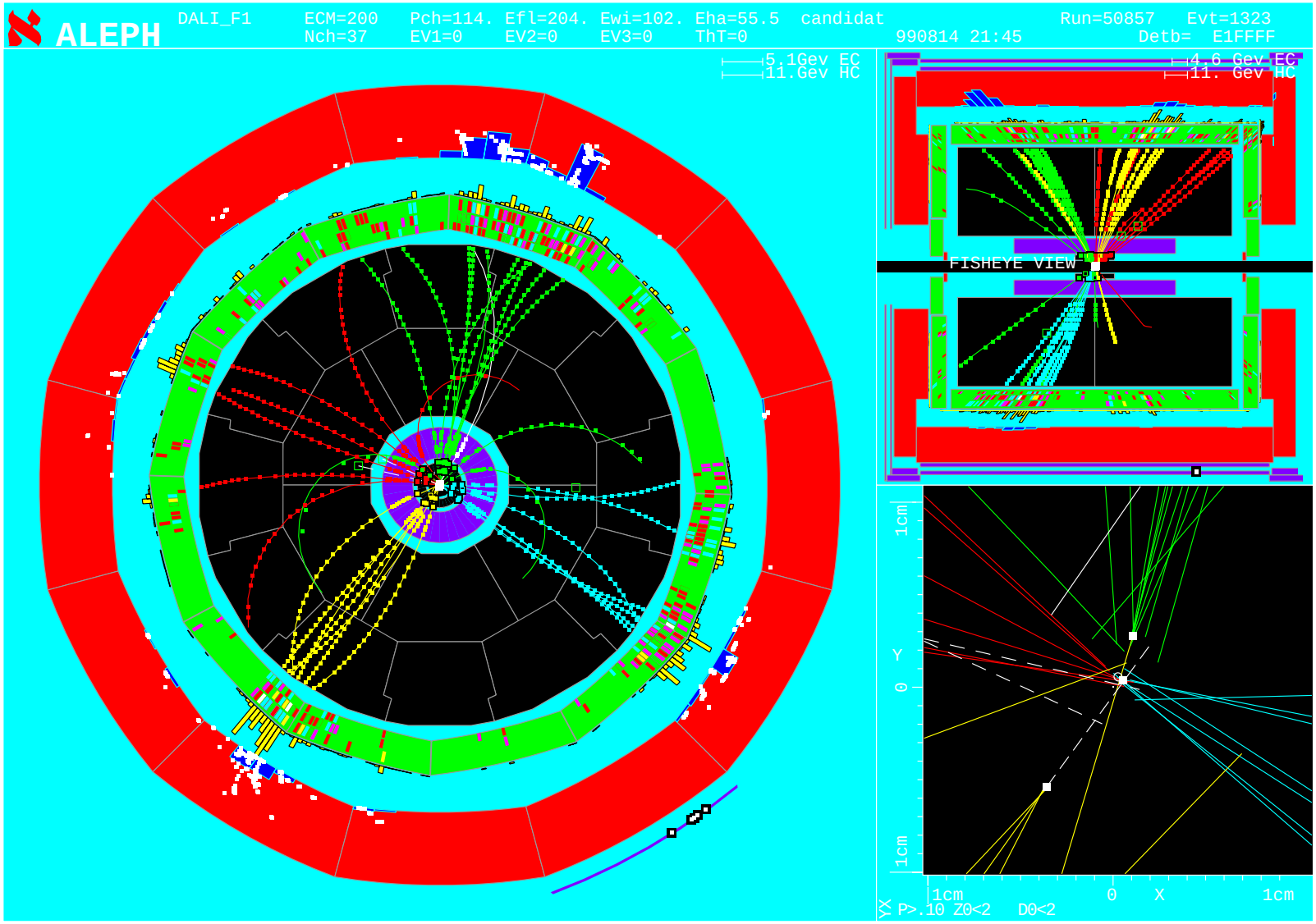
Data quality is very good.

- VDET has all 48 faces working, both sides.
  - One side of one face fixed last winter.
- No serious problems in the other detectors
  - except the TPC short, which is corrected.
- Thanks to the dedication of many experts
  - maintaining the detector hardware
  - checking the data during shifts or while on-call and reporting to the daily meeting.
  - checking continuously the performances offline.

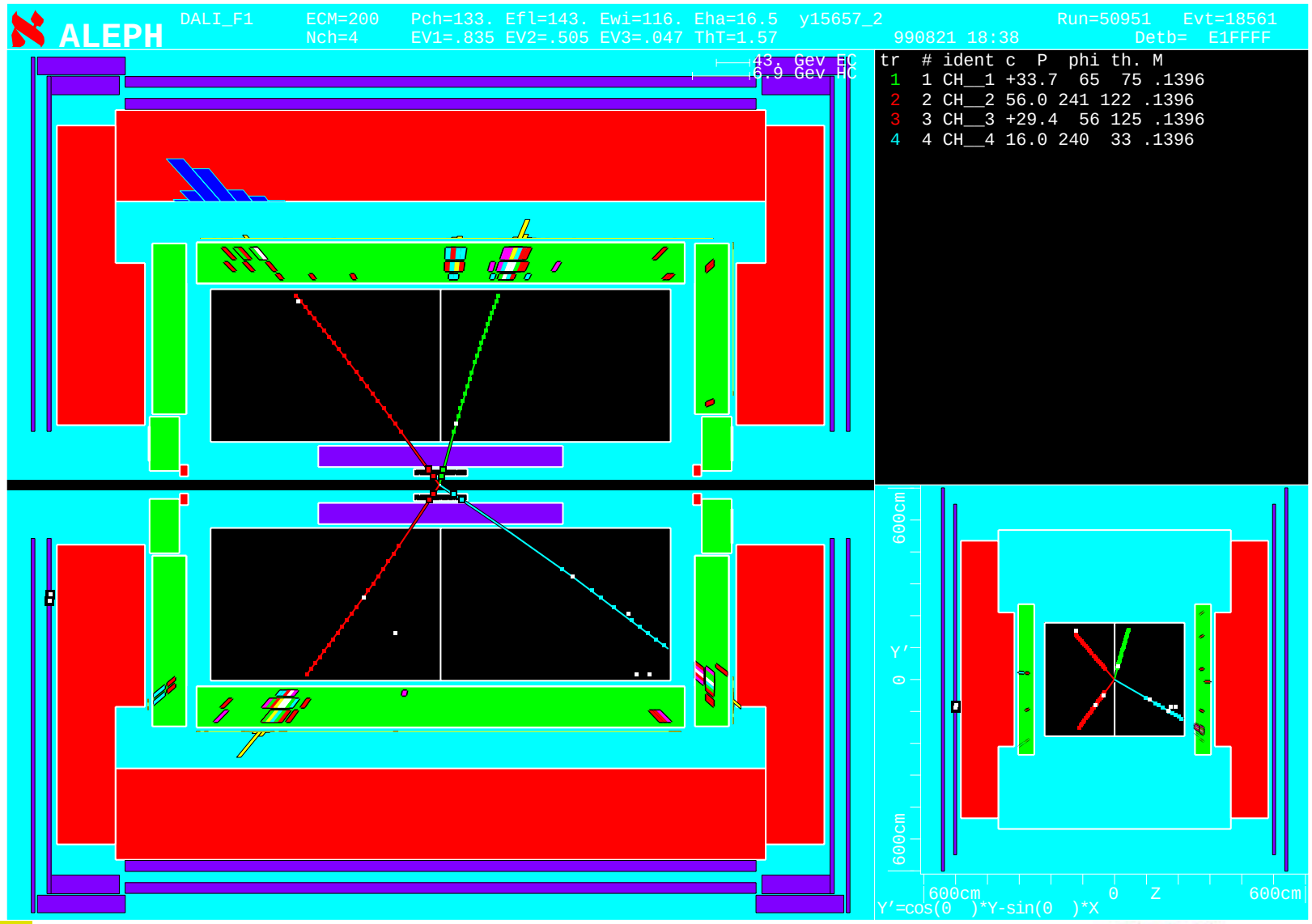
- The quality is reviewed by the Data Quality group every two weeks
  - Only 0.45 % of the data (1.39 % at 200 GeV) has been discarded so far.
- Alignment, resolution, calorimeter calibration as good as usual.

However no discovery yet...

Higgs candidate



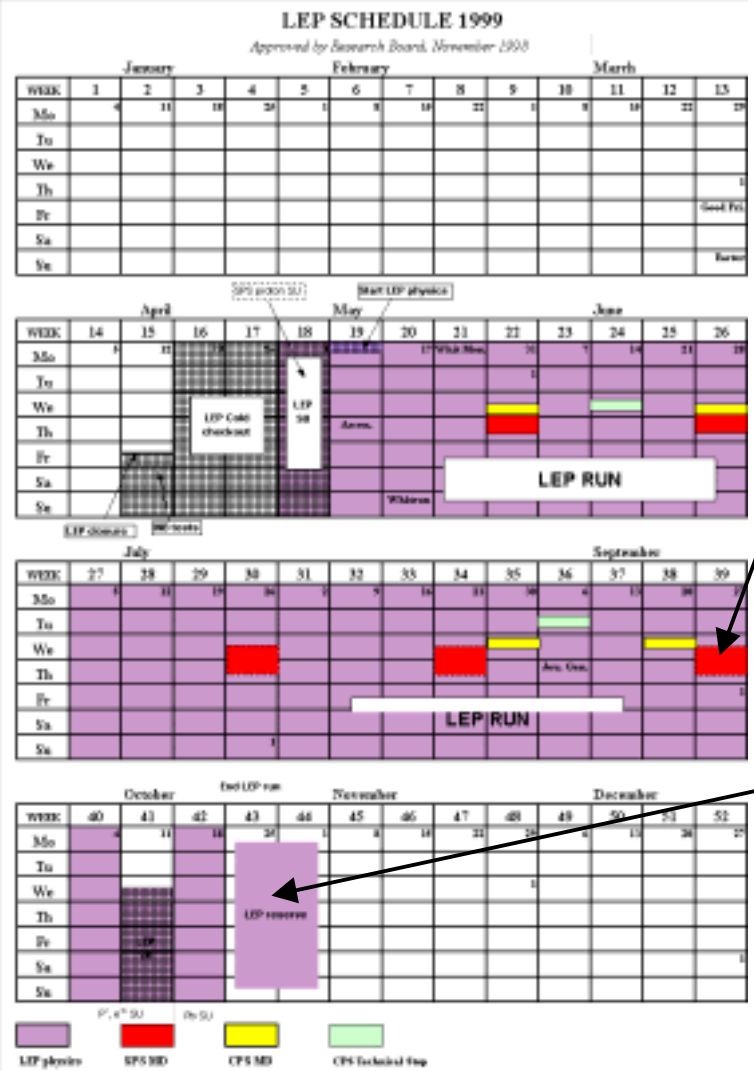
H l l candidate



For the rest of the 1999 run

- **We need the planned Z0 calibration data**
  - **Check that the correction for the short in the TPC field cage is still OK after several weeks.**
    - **Indication of charge-up, which decays slowly with time.**
    - **Field cage current has changed in the first few days, by 10 % of the effect.**
  - **Check the calorimeter calibration as usual**
  - **Scheduled during SPS MD on 29 September. Fine.**
- **Of course we will enjoy more High Energy data**
  - **And even higher energies, as soon as available !**

Preferred scenario



- Take 200 GeV data for another 2-3 weeks, to reach ~70 pb^{-1}
- Z^0 calibration on 29-30 September
- LEP increases the beam energy
  - Pending approval of French authorities
  - 101 GeV per beam was mentioned
- Take a substantial amount of data
  - 20 pb^{-1} would allow to get physics results at this new energy.
- The "LEP reserve" weeks are needed.
  - Gives enough running time.
  - Allows to benefit from improvements that LEP can be make during the stop in week 41

Shutdown work

Fix the TPC short

- Requires to enter in the field cage
  - Flush with air.
  - Remove luminosity detectors and supports.
  - Disconnect and remove a sector.
  - Find the source of the short and fix it.
  - Reconnect everything.
- A few weeks of work, before Christmas.

Normal maintenance on other detectors

- Get ready to put back flammable gas on March 6th

Analysis after 2000

A) If no reprocessing of all LEP II data is performed

- All data available by end of 2000, after the usual end of year reprocessing.
- Most analyses will be finished by the end of 2002.
- Software and data will be adapted to run on available public facilities, i.e. Linux, for possible continuation of some analyses.

B) If we improve significantly the data reconstruction

- Reprocessing will take place in 2001 using the Online computers, Monte-Carlo production should also be re-done.
- Overall schedule shifted by about one year, finished by end of 2003 with possible continuation on public platforms.

Summary

- **Very successful run**
  - LEP performance exceeds expectations.
  - Smooth and efficient ALEPH operations.
  - TPC short corrected.
- **Need more Z0 data at end of year**
  - Check the evolution of the TPC short
  - Check the calibration of the calorimeters
- **Higher energies when possible**
  - Reserve weeks needed to make the best use of the improvement.
- **Up to two years of analysis with final data**
  - End of 2002, or 2003 if we reprocess after improvements.