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Original : English  
28 June 1995

ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE  
**CERN** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

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COUNCIL

Hundredth (second part) and Hundred-and-first Sessions  
Geneva - 16 December 1994

MINUTES

As the Draft Minutes (CERN/2079/Draft, dated 21 February 1995) were approved, without amendment, at the Hundred-and-second session of Council on 23 June 1995, the attached document can be regarded as the **final version**.

ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE  
**CERN** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

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COUNCIL

Hundredth (second part) and Hundred-and-first Sessions  
Geneva - 16 December 1994

DRAFT MINUTES\*

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\* These Draft Minutes are circulated without having been seen by the President of Council, but with his consent.



## TABLE OF CONTENTS

Section	Page
LIST OF PARTICIPANTS .....	iii
1. REPORT OF THE CREDENTIALS COMMITTEE .....	1
2. ADOPTION OF THE AGENDA .....	1
3. APPROVAL OF THE DRAFT MINUTES OF THE HUNDREDTH SESSION - PART 1 .....	2
4. THE LHC PROJECT .....	2
5. PRESIDENT'S REPORT .....	13
6. STATUS REPORT BY THE DIRECTOR-GENERAL .....	14
7. ELECTIONS .....	14
8. SENIOR STAFF APPOINTMENTS .....	15
9. REPORT ON THE CLOSED SESSION .....	17
10. DRAFT BUDGET OF THE ORGANIZATION FOR THE FORTY-FIRST FINANCIAL YEAR 1995 .....	17
11. THE COST-VARIATION INDEX FOR 1995 .....	18
12. CERN PENSION FUND .....	20
13. SALARY SCALES FOR 1993 AND 1994 .....	20
14. RESOLUTION ON THE CONTRIBUTION OF GREECE .....	21
15. RESOLUTIONS ON THE RESPECTIVE CONTRIBUTIONS OF THE CZECH REPUBLIC, HUNGARY, POLAND AND THE SLOVAK REPUBLIC .....	22

## TABLE OF CONTENTS

Section	Page
16. TRIPARTITE EMPLOYMENT CONDITIONS FORUM (TREF).....	23
17. STAFF POLICY AND STAFF PLANNING .....	24
18. REVISED DRAFT TIMETABLE OF COUNCIL SESSIONS AND COMMITTEE MEETINGS 1995 .....	24
19. OTHER BUSINESS .....	25

## ANNEXES

Annex 1: Draft Agenda of the 100th and 101st Sessions of Council

Annex 2: Missing Magnet Machine  
(the Director-General)

Annex 3: General Statement by France  
(Mr P. Vimont)

Annex 4: Status Report by the Director-General

## LIST OF PARTICIPANTS

<u>President:</u>	Prof. H. Curien	France
<u>Participants:</u>	H.E. Mr W. Lang	Austria
	Prof. W. Majerotto	
	Mr A. Herdina*	
	Mr H. Schacher*	
	Prof. J. Lemonne	Belgium
	Mr P. Levaux	
	Mr G. Muylle*	
	Mrs M.J. Simoen*	
	Prof. J. Niederle	Czech Republic
	Mr Z. Venera	
	Mr M. Beránek*	
	Prof. H.H. Andersen	Denmark
	Mrs B. Sode-Mogensen	
	Mrs H. Hämäläinen	Finland
	Prof. J. Routti	
	Prof. J. Perez y Jorba	France
	Mr P. Vimont	
	Dr J. Fouan*	
	Dr D. Maugars*	
	Mr T. Zimmermann*	
	Prof. V. Soergel	Germany
	Dr H. Strub	
	Dr A. Freytag*	
	Mr K. Mömkjes*	
	Dr H. Schunck*	
	Prof. M. Floratos	Greece
	Mrs P. Spilioti*	

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\* Adviser.

H.E. Mr G. Boytha                      Hungary  
 Prof. J. Zimányi  
 Ms M. Hencsey\*  
 Dr G. Vesztergombi\*  
 Dr G. Pócsik\*  
 Mr I. Varga\*

H.E. Mr G. Baldocci                      Italy  
 Prof. L. Maiani  
 Prof. G. Castro\*  
 Prof. F. Menzinger\*

Mr J. Bezemer                              Netherlands  
 Prof. B. de Wit  
 Mr S.J.H. Smits\*

Prof. A. Graue                              Norway  
 Mr T. Pedersen  
 H.E. Mr B. Skogmo\*

Prof. J. Niewodniczanski              Poland  
 Prof. R. Sosnowski  
 Mr J. Knapik\*  
 Mr R. Kuzniar\*

Mr F.D. Bello                              Portugal

Mrs M. Krasnohorská                  Slovak Republic  
 Dr L. Sándor  
 Mr R. Demovic\*  
 Mr B. Sitár\*

Prof. C. Lopez                              Spain  
 Mr L.F. de Segovia\*  
 Mrs M. Requejo\*

Dr C. Nordling                              Sweden  
 Prof. Ö. Skeppstedt  
 Dr J. Gustavsson\*  
 Prof. G. Jarlskog\*\*

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\* Adviser.  
 \*\* Alternate.

Prof. M. Bourquin Mr J. Vernet Dr M. Gottret* Mr J.-P. Ruder*	Switzerland
Mr A. Carter Mr W. Jones* Prof. D.H. Saxon* Mr J.D. Walsh*	United Kingdom

Observers:

Mr N. Newman	Representative of the European Union
Dr S. Raither	Representative of UNESCO
Prof. D. Horn Dr R. Schnitzer	Representatives of Israel
Mr G.V. Kozlov Prof. A.N. Skrinsky	Representatives of the Russian Federation
Dr J.R. O'Fallon	DOE, Washington DC, USA
Mr A. Asano Mr H. Takahashi	Programme Officer in the Ministry of Education, Science and Culture First Secretary, Japanese Permanent Mission, Geneva

Also Present:

Dr B. Brandt	Chairman of the Finance Committee
Dr G.E. Wolf	Chairman of the Scientific Policy Committee
Prof. G. Flügge	Chairman of ECFA

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\* Adviser.

CERN Officials:

Prof. C.H. Llewellyn Smith Director-General

Directors:

Dr L.R. Evans	Associate Director for Future Accelerators
Prof. L. Foà	Director of Research
Dr K. Hübner	Director of Accelerators
Dr H. Weber	Head of Administration
Dr H. Wenninger	Technical/Research Director

Mr J.-M. Dufour	Head, Legal Service
Dr M. Jacob	Relations with Member States
Mrs H. Schmal	Council Secretariat
Mr B. Meares	Minute-writers
Miss L. Morris	

The Division Leaders concerned.

## DRAFT MINUTES

The meeting was called to order at 10.05 a.m.

The PRESIDENT welcomed: Mr Muylle of Belgium; Mrs Hämäläinen, the new delegate of Finland to Council; Mr Vimont the new delegate of France to Council replacing Mr Zeller; Mr Maugars of France; Mr Mömkes of Germany; Mrs Spilioti of Greece; Mr Kuzniar of Poland; Mr Carter, the new United Kingdom delegate to Council, replacing Mr Ritzema; and Mr Smith, also of the United Kingdom. He also welcomed as observers Dr Raither of UNESCO, representing Professor Federico Mayor Zaragoza; Mr Newman, replacing Dr Gerold, of the European Union; Professor Horn and Dr Schnitzer of Israel; Mr Kozlov, representing Minister Saltykov, and Professor Skrinsky of the Russian Federation; Mr Asano and Mr Takahashi of Japan; and Dr O'Fallon of DoE, the United States.

Apologies had been received from Dr L. Westgaard of Norway, Professor Pounds of the United Kingdom, Professor Mayor Zaragoza and Professor A. Badran of UNESCO, Dr R. Gerold of the European Union and Minister Saltykov of the Russian Federation.

1. REPORT OF THE CREDENTIALS COMMITTEE  
(Item 1 of the Agenda)

Dr WEBER presented the report of the Credentials Committee.

The report of the Credentials Committee was approved.

2. ADOPTION OF THE AGENDA  
(Item 2 of the Agenda) (CERN/2064/Rev.)

The Agenda (CERN/2064/Rev.<sup>1</sup>) was adopted.

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<sup>1</sup> See Annex 1.

## HUNDREDTH SESSION - SECOND PART

The hundredth session of Council resumed at 10.15 a.m.

### 3. APPROVAL OF THE DRAFT MINUTES OF THE HUNDREDTH SESSION - Part 1

(Item 3 of the Agenda) (CERN/2053/Draft)

On a written proposal from the United Kingdom delegation, it was agreed to amend the statement on page 19, item 15, 3. ... to read: "voting procedure now open could be closed at the second part of the session, preferably in July 1994 or, if necessary, later in the year".

The minutes of the first part of the hundredth session (CERN/2053), as amended, were approved.

### 4. THE LHC PROJECT

(Item 4 of the Agenda)

- Further Funding Options for the Large Hadron Collider and the Long-Term Scientific Programme of CERN  
(CERN/SPC/695 - CERN/CC/2072)
- Funding and Approval of the LHC  
(CERN/SPC/696 - CERN/CC/2071)

The DIRECTOR-GENERAL, presenting documents CERN/SPC/695 - CERN/CC/2072 and CERN/SPC/696 - CERN/CC/2071, said that he hoped that the decision that Council was about to take would mark the end of the first stage on a long road to build LHC, a journey which had begun in 1977 when the late Sir John Adams had argued that the internal diameter of the LEP tunnel should be kept large enough to later house such a machine. He wished to point out that, coincidentally, the Management had that day received the two proposals for the major LHC experiments.

Delegates would recall that at the June Council meeting two Member States, Germany and the United Kingdom, had stated that, although they strongly



supported the LHC project, they would require further clarification of the financial framework before approving it. In recent weeks a set of conditions concerning the future CERN Budget had emerged which appeared to be acceptable to all Member States as a basis for that approval, namely: continuation of the 10% reduction in the German contribution until the end of 1998; zero indexation of the Member States' contributions in the period 1995-1997; the assumption of 2% inflation and 1% indexation of Member States' contributions from 1998 onwards; revision of the existing voting rules applicable to certain financial matters, to allow Member States particularly concerned about future price increases to exercise tight budgetary control. The very difficult financial framework those conditions implied had been somewhat ameliorated by generous commitments from France and Switzerland to make voluntary contributions to the project.

Having assumed full indexation of Member States' contributions in its previous plans, the Management had been obliged to consider very carefully whether the LHC could be built within such tight financial constraints. Consequently, it had first examined the various activities of CERN and concluded that none of the current programmes could provide savings by premature closure without a disproportionate reduction in the Laboratory's scientific output and the waste of previous investments. As far as other economies were concerned, the December 1993 plan had already anticipated improved efficiency and savings, including a reduction in staff numbers to around 2300 in 2005, while the April 1994 proposals had suggested cuts of 400 MCHF or some 4% of the Budget over ten years. As a result of the new conditions, a further 25 MCHF savings per annum over a period of ten years would be squeezed out of the Budget and set aside for LHC by somehow reducing support and services for the ongoing activities but without cutting programmes themselves.

That amount alone, however, was not sufficient to compensate for the new stringent conditions. The Management had therefore investigated the possibility of rescheduling LHC construction. A further extension of the shutdown beyond the four years already proposed in the April 1993 programme had been ruled out on the grounds that the damage to particle physics research in the Member States would be unacceptable. That left the idea of the so-called "missing magnet"

machine<sup>2</sup>, which by staging the project in two phases would save a further 300 MCHF in the period to 2004, by initially installing two-thirds of the dipoles and running at 9.3 TeV instead of the full 14 TeV. After some three years of operation at that energy, during which the 300 MCHF would be spent on the remaining components needed, there would be a one-year shutdown to install the missing magnets and the full machine could be operational in around 2008. Such a proposal would allow LHC to be built within the above-mentioned constraints assuming no financial contributions from non-Member States.

If, by the time of the comprehensive review of the project scheduled for 1997, financial commitments from non-Member States were not sufficient to envisage reverting to the immediate construction of the full 14 TeV accelerator, the smaller machine would provide 30% less range for the discovery of heavy vector bosons and supersymmetric particles and was unlikely to produce the physics to study the Higgs particle. However, it would mean little change for the study of heavy ions, b-quarks and top quarks, and would open up a new domain where important discoveries could be made, even if it did not have the full discovery potential of the final collider. Of course, in its eagerness to unravel the secrets of nature, the scientific community would prefer to construct the full machine in one step and it was hoped, and even expected, that with help from potential partners in other regions of the world it would be possible to do so.

It was now for Council to decide whether it would allow LHC to go ahead on that basis, by passing the resolutions set out in documents CERN/2073 on the contribution of Germany, CERN/2074 concerning a double majority procedure for certain Finance Committee recommendations to Council, and CERN/2039(a)/Rev.2 on approval of the Large Hadron Collider Project, including the annexed Statement concerning the funding and approval of the Large Hadron Collider.

Dr WOLF reported that the Scientific Policy Committee had discussed the missing-magnet machine and agreed with the Director-General's assessment that it offered excellent physics potential, particularly in opening up exploration of the TeV energy range, but that in order to understand the origin of mass through exploration of the Higgs sector the full LHC machine with 14 TeV and  $10^{34} \text{ cm}^{-2}\text{s}^{-1}$  luminosity was required.

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<sup>2</sup> See Annex 2.

The PRESIDENT reported that the Committee of Council had held a thorough and constructive discussion of all the aspects of the decision concerning LHC, which had resulted in the three resolutions now submitted to Council for approval. During the meeting a number of conflicting points of view had been expressed, which had not been easy to reconcile, but the goodwill shown by all the Member States had made it possible to find a common solution that was satisfactory to all from both the physics and the financial points of view. That solution represented some very real constraints for several of the smaller Member States in particular, and he wished to underline his gratitude to them for accepting it in order to reach a general decision.

Mr VIMONT made the following statement<sup>3</sup>:

- "1. France wishes to reach a successful conclusion, based on the proposals of the Director-General of CERN and after hearing all the Member States, for the settlement of all the technical items under discussion.
2. France confirms the exceptional effort, amounting to 64.5 million Swiss francs, made for the construction of LHC under the terms set out by F. Fillon in his letter to CERN dated 16 September 1994.
3. France has been asked whether it can consider indexing its contribution as from 1998 in accordance with the assumption made in the Director-General's plan, to improve the project.

The reply is yes, and France hopes that other countries will be able to join it, since those who, last June, gave their agreement, did so on the basis of integral indexation.

It is important not to lose sight of the essential scientific aim as recalled by the Director-General, that of deciding to build LHC."

If necessary, the French Minister for Higher Education and Research was prepared to confirm the statement in a letter to CERN.

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<sup>3</sup> See Annex 3 for the original text in French.

In conclusion, he wished to thank the President of Council, the Director-General, the staff concerned and his fellow delegates for all their hard work and patience throughout the difficult negotiations of recent months, and to echo the President in acknowledging the particular effort and sacrifices of some of the smaller Member States.

Mr VERNET said that the Swiss delegation wished to express its satisfaction at the successful culmination of what had been a long and rather difficult period, and to thank in particular the President, Professor Curien, for his role in the discussions. While Switzerland was opposed to discriminatory obligations, it had always demonstrated its willingness to help the various international organizations to whom it was host through special contributions. In that context, he confirmed that, in addition to the voluntary extra contributions already announced, his country could agree to index its contributions by 2% from 1998 onwards, in line with the assumption for inflation in the financial plan, for the duration of the construction period. That meant an additional 23.5 MCHF over ten years for Switzerland which, added to a corresponding effort of some 100 MCHF from France, represented a substantial amount towards the missing funds needed to facilitate the decisions to be taken at the 1997 review. Like the anticipated financial commitments from non-Member States, its sole aim must be to strengthen the available resources to construct the project within the original schedule. Finally, he wished that the additional financial effort in which Switzerland was participating would enable the Management to take some account of the significant sacrifices being asked of the CERN personnel.

Professor LOPEZ, congratulating the Management and the CERN staff on its efforts to permit the construction of the world's most ambitious accelerator within very stringent budgetary conditions, said that Council's forthcoming decision represented a crucial step for the future of the Laboratory and high energy physics worldwide. The three resolutions submitted for approval by the Committee of Council were a fair compromise and provided a realistic working framework, not only for the Laboratory but also for the many scientific groups in the universities and national laboratories connected with CERN. The Spanish delegation therefore accepted them, together with the sacrifices and commitments they implied for the coming years, which must take second place

to the overall objective of building LHC. Once approved, he was confident that the programme would mobilise the energies and enthusiasm of the whole Organization.

Ambassador BALDOCCI said that he wished to express his satisfaction at the positive developments concerning LHC approval, which was a matter of prime importance for Italy, and was confident that Council's decision would be a momentous one for the future of CERN. The thoroughness of the preceding discussions which had been needed to reconcile the desire to build such a large-scale project with the rather difficult economic and financial situations in many of the Member States was, furthermore, a reassuring sign for potential partners in LHC that all aspects of the matter had been given full and serious consideration. Expressing his appreciation for the priority accorded to the matter by all in recent weeks, he thanked the President of Council, the Director-General and the various delegations who had helped to resolve the problems encountered.

Mr BEZEMER, extending particular thanks to the two Host-States for their generous extra contributions, said that he wished to reaffirm the Netherlands delegation's support for LHC and the relevant resolutions. However, while he appreciated the fact that the conditions for approval had been formulated in a constructive spirit, he was concerned about the implications that some of them would have on the Organization and by the fact that they were not fully the result of the usual procedure of seeking consensus among all nineteen Member States but of negotiations between a small sub-set of the larger Member States. He hoped that once the pressure of approving the project had been lifted, the discussion on optimising the financial and technical planning would resume in the democratic fashion that had been the basis of the Organization's success.

By approving LHC the Member States would be committing themselves to CERN and to high energy physics for a long period in rather difficult economic circumstances. That also placed a great deal of responsibility on the shoulders of the CERN staff and its users, in whose hands the project's success lay. In return for the job security the project's approval would bring, they would be obliged in future to make some real concessions with regard to employment conditions. In conclusion, his delegation wished to thank everyone concerned for their hard work in the last five months, and to congratulate the President and the Director-General on the results of their tenacity.

Mr LEVAUX said that he wished to associate himself with the Swiss delegation in congratulating the President of Council on the way in which he had patiently and skilfully resolved the many political and administrative difficulties of the past few months. He also expressed satisfaction that a consensus had been reached which would allow the Director-General to start drawing up the detailed proposal required for 1997.

Professor SKEPPSTEDT observed that the conditions for LHC approval would certainly present some rather serious difficulties for smaller countries like Sweden, as emphasized by the President of Council earlier. Nevertheless, his delegation was very satisfied that a consensus of opinion had been reached that should enable Council to approve the project unanimously and thereby to take a great step, not only for high energy and particle physics, but also for free, unbound natural science.

Dr STRUB said that he wished to thank the Director-General, the Management and the staff concerned for their thorough financial, technical and scientific preparation of the decision, without which it would not have been possible to reach the compromise on which Council was about to vote, and was confident that it would open up new territory for science and for high energy physics in particular. He also wished to thank France and Switzerland for their special contributions, and all the delegations, particularly the United Kingdom, for their cooperation and understanding in working to overcome the various difficulties for the good of their common goal. With what could be anticipated as the forthcoming approval of LHC the long-term future of the Organization was secured and he wished the Director-General, the Management and the CERN personnel every success in their future efforts for the advance of science.

Mr VIMONT, replying to a request for clarification by Dr STRUB, confirmed that, like Switzerland, France agreed to the indexation of its contributions by 2% from 1998 onwards, in line with the assumption for inflation, for the duration of the construction period.

Mr CARTER said that he wished to express his gratitude for the help and consideration shown by his fellow delegates and the CERN Management in working towards a solution to the various difficulties encountered in recent months, and in particular for the commitments made by the two Host-States to further voluntary contributions to the project. The proposal before Council

represented a financially sustainable framework for LHC and promised excellent science, and he felt honoured to be present at what he trusted would shortly be the inauguration of a project with truly global prospects.

Ambassador BOYTHA, expressing his satisfaction at the compromise solution reached by the CERN Management and the Member States through their tenacious negotiations, said that the Hungarian delegation wished to extend its thanks to all those countries who had made substantial or additional financial commitments in spite of their own economic problems. What had been achieved was not only a great step forward in the field of high energy physics but also a tremendous example of European unity and cooperation. With LHC Europe would offer world leadership in the exploration of the universe and he firmly hoped that its future results would be to the benefit of mankind.

Professor ROUTTI said that Finland reaffirmed its support for LHC as expressed at the June Council meeting and could accept all the conditions for its approval as set out by the Director-General in his earlier presentation. LHC was an excellent platform for promoting the European and worldwide collaboration that was so important in many fields of science, and in that connection he hoped that there would be strong intellectual and financial non-Member State participation in the project. He too thanked the two Host-States for their generous extra contributions and congratulated the President of Council, the Director-General and everyone concerned for making the decision possible. Finally, the Finnish delegation wished the Organization, its staff and all the participating countries every success for the future of LHC.

Mr BELLO, reaffirming the Portuguese delegation's positive vote for LHC, said that the project offered outstanding opportunities for future physics research and was an exceptional model for European and international cooperation. Without sacrificing the current programme, the Organization now had a realistic and sustainable financial framework in which to develop its new project. Finally, he wished to associate himself strongly with the thanks of the other delegations to the Host States for their additional commitments.

The PRESIDENT then resumed the voting procedure opened at the first part of the Hundredth Session of Council in June 1994.

Council took note of documents CERN/SPC/695 - CERN/CC/2072 and CERN/SPC/696 - CERN/CC/2071 and, by consensus, unanimously adopted

- the Resolution on the contribution of Germany (CERN/2073);
- the Resolution concerning a double majority procedure for certain Finance Committee recommendations to Council (CERN/2074);
- the Resolution - Approval of the Large Hadron Collider (LHC) Project (CERN/2039(a)/Rev.2);
- the Statement concerning the funding and approval of the Large Hadron Collider (LHC) set out in document CERN/2075 and annexed to document CERN/2039(a)/Rev.2.

The PRESIDENT said that the decision marked a great moment in the history of CERN.

Applause.

The DIRECTOR-GENERAL made the following statement:

"The approval of LHC is a major step for world and European particle physics and for CERN. It opens the prospect of important progress in man's ancient quest for the nature and origin of matter. It will take ten years or more to build LHC and at least ten years to carry out the rich experimental programme which it offers. Council's decision today therefore represents a commitment of over twenty years with a value of over twenty billion Swiss francs. I believe this to be a unique commitment to fundamental science research. We at CERN and in the European and world particle physics community are very much aware of the privileged position we occupy and we are very conscious of and grateful for the fantastic vote of confidence in fundamental science, particle physics and in CERN which approval of LHC implies. We also understand that the difficulties in reaching agreement to approve LHC arose precisely because our governments recognised that it is such a serious and long-term commitment and we are very grateful for the fact that as a result we can now proceed with the challenging task of building LHC with the certainty that the finances will be there to allow



it to be completed. For the future we face the real challenge of building the LHC under tough financial conditions. I believe that with the continued support of CERN's outstanding staff we can meet that challenge. The outstanding work and achievement of CERN staff in the past has laid the foundation for LHC, which will incorporate so much of CERN's existing infrastructure. Over half the project already exists, and it will profit from the superb quality and performance of the existing accelerators which have been built up over so many years. We greatly look forward to bringing in our friends in other regions of the world as partners in LHC. Obviously we seek their contributions to speed up and improve the project, but even more we seek their intellectual contributions. Three months ago CERN celebrated its fortieth birthday. Fortieth birthdays are occasions to look both backwards and forwards and I think CERN can look back with justified satisfaction on its history. We can also now look forward. Today's decision has assured a great future for world particle physics and for CERN."

Applause.

Dr WOLF said that Council's decision was a great moment for particle physicists and he wished to thank the delegates for their efforts in convincing their respective governments of the worthiness of the LHC project. Emphasizing the inter-regional nature of the collaboration, he pointed out that if the superconducting cable for the LHC magnets were laid out in a single strand from end to end it would span the orbit of the earth around the sun. The work on the collider and the detectors could now begin in earnest, and delegates could look forward to the first exciting results in the next decade. It would certainly take until 2020 or 2025 to explore the vast continent of LHC physics.

Professor FLÜGGE said that, on behalf of the European high energy physics community, he also wished to thank and congratulate all the delegations and the CERN Management on the unanimous approval of LHC, which was a momentous step in CERN's history. He welcomed with immense joy and satisfaction a decision which would take high energy physics far into the next century with exciting new prospects for research and discovery.

Dr STRUB said that, on behalf of the German delegation and all his fellow Council delegates, he wished to pay tribute to the President of Council for his work in securing the successful outcome of the decision.

Applause.

The PRESIDENT invited the observers to comment.

Dr O'FALLON said that, on behalf of the United States high energy physics community and the Department of Energy, he wished to extend his congratulations to Council and to the CERN Management on their very important decision, not only for the future of the Organization but for high energy physics worldwide. Reaffirming his country's interest in participating in LHC, he invited the Director-General and his negotiating team to visit Washington at the earliest possible moment to begin serious discussions on the exact nature of the United States high energy physics community's involvement in the project. In that connection, he looked forward to profitable financial and, most importantly, scientific collaboration between his country and the CERN Community.

Professor SKRINSKY, joining in the congratulations, said that he wished to express the hope that LHC would provide the opportunity for active collaboration between scientists and physicists from all over the world, including the non-Member States, for the benefit of the project and for high energy physics in general.

Mr NEWMAN said that, on behalf of the European Commission, he also wished to congratulate Council on its decision and to acknowledge the financial, managerial and technical ingenuity which had made it possible. Special thanks were due to the President of Council and the Director-General for all the hard work that had gone into preparing the decision. It was a great day for European endeavour, and he extended his best wishes for the success of the machine construction and the scientific work to follow which, it was to be hoped, would include the participation of non-Member States.

Dr RAITHER said that, on behalf of UNESCO, he also wished to congratulate Council on its decision to build a research facility that would be a major asset for world science. Long-standing special relations dating back to

CERN's foundation under the auspices of UNESCO linked the two organizations, and the latter was understandably proud of the success CERN had achieved as a centre of European scientific cooperation and a pole of attraction to scientists world-wide. He therefore hoped that appropriate mechanisms would be found to bring non-Member States into the project so that, like other CERN facilities, LHC would be available for research by the world particle physics community. CERN's foundation in the post-war years had set a precedent in uniting European nations to pool their talents and resources for high-level research in large facilities, and the LHC now offered the exciting opportunity of establishing a model for global collaboration that would bring together all interested scientists world-wide.

Mr TAKAHASHI said that he was honoured to have witnessed the unanimous approval of CERN's latest project and, on behalf of the Japanese government, wished to join in the congratulations to Council on its historic decision. Japanese researchers were looking forward to participating in LHC and discussions could now begin on the precise details of Japan's involvement in the project.

Professor HORN, associating himself with the congratulations of the previous speakers, said that the Israeli high energy physics community looked forward to many years of fruitful collaboration and participation in LHC.

The hundredth session of Council rose at 11.30 a.m.

The hundred-and-first session of Council was called to order at 12.05 p.m.

5. PRESIDENT'S REPORT  
(Item 5 of the Agenda) (Oral)

The PRESIDENT did not make an oral report.

## 6. STATUS REPORT BY THE DIRECTOR-GENERAL

(Item 6 of the Agenda) (Oral)

The DIRECTOR-GENERAL presented his report<sup>4</sup>, following which Dr CAILLAU demonstrated CERN's World Wide Web software system.

Applause.

Council took note of the report by the Director-General and congratulated him on the year's work of the Laboratory.

The meeting was adjourned at 1.10 p.m. in open session and resumed in closed session at 2.40 p.m.

## 7. ELECTIONS

(Item 15 of the Agenda) (Closed Session)

- Composition of the Scientific Policy Committee  
Appointment of One New Member  
(CERN/2065) (Confidential)

On the recommendation of the Scientific Policy Committee, Council unanimously decided:

- to appoint Professor J. Lefrançois member of the Scientific Policy Committee for a period of three years from 1st January 1995;
- to re-appoint Dr G.E. Wolf member of the Scientific Policy Committee for a second period of three years from 1st January 1995.
- Election of the Chairman of the Scientific Policy Committee

On the recommendation of the Scientific Policy Committee, Council unanimously decided to re-elect Dr G.E. Wolf Chairman of the Scientific Policy Committee for a further period of one year from 1st January 1995.

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<sup>4</sup> See Annex 4.

- Election of the President of Council

Council unanimously decided to re-elect Professor H. Curien President of Council for a second period of one year from 1st January 1995.

- Election of one of the Vice-Presidents

Council unanimously decided to elect Mr P. Levaux Vice-President of Council for a period of one year from 1st January 1995.

- Election of a new Chairman of the Finance Committee

On the recommendation of the Committee of Council, Council unanimously decided to elect Dr M. Gigliarelli Fiumi Chairman of the Finance Committee for a period of one year from 1st January 1995.

- Re-appointment of one of the Vice-Chairmen of the Governing Board of the Pension Fund  
(CERN/2066) (Confidential)

Council unanimously decided to re-appoint Dr W.C. Middelkoop Vice-Chairman of the Governing Board of the Pension Fund for a further period of one year from 1st January 1995.

## 8. SENIOR STAFF APPOINTMENTS

(Item 16 of the Agenda) (CERN/SPC/692 - CERN/CC/2058) (Confidential)  
(Closed Session)

- Appointment of the Head of Administration

In accordance with its decision in Closed Session in June 1994 to delegate the President and Vice-Presidents of Council and the Chairmen of the Finance Committee and the Scientific Policy Committee to appoint a new Head of Administration, Council took note of the appointment of Dr M. Robin as Head of Administration for a period of three years from 1st January 1995.

- Re-appointment of Division Leaders

On the recommendation of the Scientific Policy Committee and the Committee of Council, Council decided to re-appoint:

- Dr G. Bachy Leader of the Mechanical Technologies Division for a period of one year from 1st January 1995;
  - Dr F.A. Ferger Leader of the Technical Support Division for a period of three years from 1st January 1995;
  - Mr J. Ferguson Leader of the Administrative Support Division for a period of six months from 1st January 1995;
  - Dr J.-P. Gourber Leader of the Accelerator Technologies Division for a period of one year from 1st January 1995;
  - Dr W.C. Middelkoop Leader of the Personnel Division for a period of six months from 1st January 1995;
  - Mr A.J. Naudi Leader of the Finance Division for a period of six months from 1st January 1995.
- Appointment of a Division Leader

On the recommendation of the Scientific Policy Committee and the Committee of Council, Council also decided to appoint:

- Dr G. Goggi Leader of the Particle Physics Experiments Division for a period of three years from 1st January 1995.

Council also took note that further proposals concerning the Divisions in the Administrative Sector and the Mechanical Technologies and LHC Divisions would be made in 1995 for implementation from 1st July 1995.

Council further took note that, in accordance with its decision in Closed Session at the first part of the hundredth session in June 1994, the title of LHC Project Leader had been conferred on Dr L. Evans, as the member of the Directorate with responsibility for the LHC project, with effect from the moment that the LHC had been approved.

The meeting adjourned in closed session at 2.50 p.m. and resumed in open session at 2.55 p.m.

9. REPORT ON THE CLOSED SESSION

(Item 17 of the Agenda)

The DIRECTOR-GENERAL reported on the decisions taken during the closed session.

Professor MAIANI said that CERN's ability to attract so many talented people was one of the reasons for its success. In particular, he was delighted by the appointment of Professor Lefrançois to the Scientific Policy Committee and by the re-appointment of its Chairman, Dr Wolf, for whose work he wished to express his great appreciation. He also congratulated Professor Curien on his re-election as President of Council and Mr Levaux on his election as Vice-President. Finally, he thanked the outgoing Vice-President, Dr Strub, for all his work for Council.

Council took note of the report.

10. DRAFT BUDGET OF THE ORGANIZATION FOR THE FORTY-FIRST FINANCIAL YEAR 1995

(Item 7 of the Agenda) (CERN/FC/3715/Draft)

Dr WEBER introduced the document.

Dr BRANDT, Chairman of the Finance Committee, reported that the Committee had discussed the matter both in September and at its meeting two days previously. The main discussion, in September, had been fairly short, reflecting the fact that the general outlines of the budget were closely in line with earlier decisions, for instance in the medium-term plan and the decision on the budget level taken in June. In September, one delegation had asked for a closer coupling between the presentation in the medium-term plan and the budget. Two delegations had expressed concern at the constant or even slightly decreasing level of resources for fellows and associates from Member States. They felt that the fellowship programme was such an integral part of the scientific

programme that it ought to be protected against savings. The increased number of Member States was also leading to fewer successful candidates per country. That observation had been favourably received by the Chairman of the Scientific Policy Committee and the Management, which had pointed that the five-yearly review of the fellowship programme was scheduled for June 1995 and that the issue could be brought up then.

In conclusion, the Finance Committee had unanimously decided to recommend to Council to approve the 1995 budget, amounting to 918.7 MCHF at 1994 prices, and to authorize the Committee to approve, on its behalf, the final budget at 1995 prices in March 1995.

The DIRECTOR-GENERAL said that the Management had given serious consideration to the request for a closer coupling between the presentation in the medium-term plan and the budget. The present intention was to leave both the four-year plan and the budget in their present format, but to show the four-year plan in both presentations, as there was some convenience in viewing it from both standpoints.

Council took note of document CERN/FC/3715/Draft and, on the recommendation of the Finance Committee, unanimously decided to approve the 1995 Budget amounting to 918.7 MCHF at 1994 prices and to authorize the Finance Committee to approve on its behalf the final Budget at 1995 prices in March 1995.

11. THE COST-VARIATION INDEX FOR 1995  
(Item 8 of the Agenda) (CERN/FC/3744)

Dr BRANDT reported that at the Finance Committee's meeting on 14 December, the Committee had decided, by 15 votes in favour and four against (Austria, Czech Republic, Poland and Switzerland) to accept a compromise proposal package from the Chair, to recommend Council to grant an overall cost-variation index of zero percent, comprising a weighted average salary adjustment of 0.39% to be financed within the Personnel Budget; an overall Personnel Budget cost-variation index of zero percent; and an overall Materials Budget cost-variation of zero percent. That proposal had been supported by Member



States representing 93% of the contributions. The recommendations implied that there would be no increase in Member States contributions resulting from the cost-variation index in 1995. Some delegations had made comments concerning their vote. For example, the German delegation had stated that if there had been a separate vote on a salary adjustment of 0.39% it would have abstained. The French delegation had stated that it had supported the proposal only in view of the close connection between the cost-variation index recommendation and the LHC decision. The Committee also recommended to Council on the assumption that a salary adjustment of 0.39% was granted, to fix the health insurance contributions at 6.85% of basic salary for CERN and 3.42% for the staff.

Mr WALSH, Chairman of TREF, said that the cost-variation index had been subjected to the procedure that had been agreed in 1993, and had been discussed by TREF, where the consensus achieved had helped the Finance Committee to reach the proposal tabled. The Chairman of the Finance Committee had noted that it was a consensus and not an agreement, as some delegations had been unable to vote for the whole package while others might have wished to vote in a more finely structured way. However, the present proposal was the best that was likely to be made.

Council took note of document CERN/FC/3744.

On the recommendation of the Finance Committee, Council unanimously decided to grant:

- an overall cost-variation index of zero percent.

Council also decided, by 18 votes in favour with one abstention (Germany), to grant

- a weighted average salary adjustment of 0.39% to be financed within the Personnel Budget.

On the recommendation of the Finance Committee, Council further unanimously decided to grant:

- an overall Personnel Budget cost-variation index of zero percent;
- an overall Materials Budget cost-variation of zero percent.

On the recommendation of the Finance Committee, Council also unanimously decided, in line with Article V 1.02 of the Staff Rules, to fix the health insurance contributions at 6.85% of basic salary for CERN and 3.42% for the staff.

12. CERN PENSION FUND

(Item 9 of the Agenda)

- Adjustment of Pensions  
(CERN/FC/3737)

Dr BRANDT, introducing the document, noted that the Finance Committee had decided by 15 votes in favour and four against (Denmark, Germany, the Netherlands and Sweden), with no abstentions, to recommend Council to approve the proposal of the Governing Board of the Pension Fund, supported by the Management, to adjust pensions, fixed benefits and allowances by 1% with effect from 1 January 1995.

On the recommendation of the Finance Committee, Council decided, by 15 votes in favour and four against (Denmark, Germany, the Netherlands and Sweden), to approve the proposal in document CERN/FC/3737 to adjust pensions, fixed benefits and allowances by 1% with effect from 1st January 1995.

13. SALARY SCALES FOR 1993 AND 1994

(Item 10 of the Agenda) (CERN/FC/3731 - CERN/CC/2059)

Dr WEBER introduced the document.

Dr BRANDT said that the Finance Committee had, on the Chairman's proposal, unanimously decided to recommend to Council to award a salary index of 2.46% for 1993; and a salary index of 1.2% for 1994. That meant that the salary adjustments recommended by the Finance Committee would be identical to those actually applied.

Council took note of document CERN/FC/3672 - CERN/CC/2059 and, on the recommendation of the Finance Committee, unanimously decided to grant:

- a salary index of 2.46% for 1993; and
- a salary index of 1.2% for 1994.

#### 14. RESOLUTION ON THE CONTRIBUTION OF GREECE

(Item 11 of the Agenda) (CERN/2068)

The DIRECTOR-GENERAL, introducing the document, explained that the draft resolution would clear up an anomaly that had existed since 1990 when the arrangement under Article VII.1 (b) (ii) of the Convention had expired. He and the President had visited Athens in May, as requested under the terms of the previous resolution of December 1993, to discuss the matter with the Greek authorities and try and reach an agreement on the increase of their CERN contribution. The present resolution in document CERN/2068 directly reflected the final conclusions reached by the Committee of Council in September 1994.

Professor FLORATOS pointed out that for the past 15 years Greece had experienced major problems in paying even 0.4% of the CERN budget every year. In trying to settle that debt, Greece had paid up the equivalent of three contributions of 0.4% in the past year. In the next year it was to pay the equivalent of two such contributions. It should be recalled that Greece had received a zero industrial return for more than 25 years, and that it would be very hard for the country to start increasing its contribution soon if its scientific infrastructure was not adequately developed and unless some industrial return was received. He therefore had to insist on the Greek proposal set out in the document CERN/CC/2060, Annex II, and ask Council to allow the increase in payments to commence from the beginning of 1999, i.e. one year later than in the Management's proposal.

Mr BEZEMER said Council had on more than one occasion granted a contribution reduction to Greece and the present proposal represented a rather smooth increase to a full contribution. His delegation therefore considered that the Greek delegation should be able to convince its authorities that it was the most that the Organization could do.

Mr HERDINA, supported by Professor SKEPPSTEDT, expressed the hope that the practice of accepting reductions in Member States' contributions might end with the documents submitted under the present and following items of the agenda, and that during the period of LHC construction some monetary discipline would be exercised by Member States.

In reply to a remark by the PRESIDENT, regarding industrial return for Greece Dr WENNINGER said that under the new industrial return policy the Management was making efforts to rectify the situation.

Council adopted, by 18 votes in favour and one against (Greece), the Resolution set out in document CERN/2068.

15. RESOLUTIONS ON THE RESPECTIVE CONTRIBUTIONS OF THE CZECH REPUBLIC, HUNGARY, POLAND AND THE SLOVAK REPUBLIC  
(Item 12 of the Agenda) (CERN/2069)

The DIRECTOR-GENERAL introduced the item.

- Resolution on the Contribution of the Czech Republic  
(CERN/2069/A)

Professor NIEDERLE said that the Czech delegation was content with the proposal concerning his country's future contribution and grateful to the Member States for their understanding and for facilitating its first years in CERN.

Council unanimously adopted the Resolution set out in document CERN/2069.

- Resolution on the Contribution of Hungary  
(CERN/2069/B)

Professor ZIMÁNYI expressed gratitude for the understanding shown by the Management and Member States in preparing the document that was to be voted on.

Council unanimously adopted the Resolution set out in document CERN/2069.

- Resolution on the Contribution of Poland  
(CERN/2069/C)

Professor NIEWODNICZANSKI said his delegation was appreciative of the way that the Management and the Committee of Council had taken his country's situation into account.

Council unanimously adopted the Resolution set out in document CERN/2069.

- Resolution on the Contribution of the Slovak Republic  
(CERN/2069/D)

Mrs KRASNOHORSKÁ thanked the Management and Member State delegations for the positive approach, goodwill and sympathy for the new democracies shown in their work.

Council unanimously adopted the Resolution set out in document CERN/2069.

16. TRIPARTITE EMPLOYMENT CONDITIONS FORUM (TREF)  
REPORT BY THE CHAIRMAN  
(Item 13 of the Agenda) (CERN/FC/3758)

Mr WALSH introduced the document, noting that satisfactory progress had been made in TREF's work and in informing delegates of the Member States of the intricacies concealed behind matters reported in Finance Committee and Council meetings, matters which delegates welcomed the opportunity to study at first hand. All parties in TREF, for instance, agreed that the Staff Rules and Regulations was a large and unwieldy document and that the revision, to bring it into line with present circumstances, would have to be extremely thorough. Work on the five-yearly salary review would also create large amounts of data, only a portion of which would in the long run be useful after further analysis. Thanks to the goodwill of all three parties involved in the discussions good progress was being achieved, but the large workload meant that it would have a difficult year ahead of it.

Council took note of document CERN/FC/3758 and of the oral presentation by the Chairman of the results of the Forum's third meeting on 13 December 1994.

17. STAFF POLICY AND STAFF PLANNING

(Item 14 of the Agenda) (CERN/FC/3747 - CERN/CC/2067)

Mr WALSH introduced the document.

The DIRECTOR-GENERAL drew attention to the document on human resources planning included as an annex.

Council took note of document CERN/FC/3747 - CERN/CC/2067.

18. REVISED DRAFT TIMETABLE OF COUNCIL SESSIONS AND COMMITTEE MEETINGS 1995

(Item 18 of the Agenda) (CERN/2056/Draft 2)

Dr STRUB explained that his successor as head of the German delegation would have difficulty in attending the meeting of the Committee of Council scheduled for the second week of September.

Council approved document CERN/2056/Draft 2 and, on the proposal of the German delegation, invited the Director-General to contact delegations concerning the scheduling of the September meetings.\*

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\* Following further discussions with the German delegation, it has been decided that the dates of the September meeting should not be changed.

## 19. OTHER BUSINESS

(Item 19 of the Agenda)

- 1995 Budget - Scale of Contributions at 1994 Prices  
(CERN/FC/3754)

Dr WEBER introduced the document.

Dr BRANDT reported that the Finance Committee had unanimously decided, with the Portuguese delegation voting *ad referendum*, to recommend Council to approve the scale of contributions for 1995 at 1994 prices set out in document CERN/FC/3754.

On the recommendation of the Finance Committee, Council unanimously approved the scale of contributions for 1995 at 1994 prices as set out in document CERN/FC/3754.

- Departure of Dr H. Strub

The PRESIDENT said that he wished to bid farewell to one of the Vice-Presidents, Dr Strub, who was that day attending Council for the last time. Dr Strub had also been German delegate to the Committee of Council since September 1991 and to Council since December 1991. He played an important role in many organizations concerned with international scientific cooperation, where he was highly appreciated for his great skill and perfect equanimity. On behalf of Council, he thanked him for all his work and wished him much future satisfaction in all the fields where he would continue to exercise his many talents.

Applause.

Dr STRUB, thanking the President for his kind words, said that he had greatly appreciated the time he had spent at Council with the Management and fellow delegates, which had been very rewarding for him personally in spite of sometimes difficult official responsibilities. On his departure he not only looked back with satisfaction at what had been achieved but also forward with anticipation to the real start of CERN's new project and its future success.

Applause.

– Retirement of Dr B. Brandt as Chairman of the Finance Committee

The PRESIDENT said that he also wished, on behalf of Council, to thank and bid farewell to Dr Brandt, who was relinquishing his post as Chairman of the Finance Committee at the end of the year. Presenting him with an engraved gavel as a memento of his term of office, he expressed his great appreciation for his most precise and cordial guidance of what was not the easiest of the Organization's committees.

Applause.

Dr BRANDT, thanking the President for his gift, said that his three years as Finance Committee Chairman had been an honour and a pleasure. Having taken up the post at the moment when CERN had just received the Eurolep arbitration tribunal's decision requiring the Organization to pay some 100 MCHF to the consortium involved in the excavation of the LEP tunnel, he felt a certain satisfaction that at his last meeting as Chairman the books had finally been closed on the matter. Among other important issues dealt with during his term of office had been the introduction of the new purchasing rules approved by Council in December 1993, whose progress would be ably monitored by his successor, Dr Gigliarelli Fiumi, the chairman of the former working group on that matter. If the Finance Committee had not been the most important body in preparing the decision on LHC, it had nevertheless been affected by the associated planning, as reflected in its recommendation to Council for zero indexation in anticipation of the project's approval. In conclusion, he wished to express his gratitude to all those members of the CERN staff who had provided him with the necessary assistance and support during his term of office, in particular the Directorate, the Council Secretariat, the Finance Division and the Legal Service, and wished the Organization a glorious future as the world's leading high energy physics laboratory.

Applause.



– Retirement of Dr H. Weber as Head of Administration

The DIRECTOR-GENERAL said that Dr Weber's term of office as Head of Administration was due to end on 31 December 1994. In performing a very demanding job under often difficult conditions, Dr Weber had served the Organization with great conscientiousness and loyalty and, on behalf of his own predecessor, Professor Rubbia and himself, he thanked him for all his efforts.

Applause.

– End of the term of office of two Division Leaders

The DIRECTOR-GENERAL said that, finally, he wished to pay tribute to Dr J. Allaby, head of the Particle Physics Experiments Division, and Dr P. Innocenti, head of the Electronics and Computing for Physics Division, whose terms of office were also ending on 31 December 1994. Their exemplary work for CERN in their respective fields had been greatly appreciated, and he looked forward to their continued services to the Organization in their new capacities as coordinators, Dr Allaby for non-Member State matters and Dr Innocenti for relations with the European Union.

Applause.

The meeting rose at 4.05 p.m.

\* \* \*

DRAFT AGENDA  
OF THE 100TH AND 101ST SESSIONS OF COUNCIL

ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE  
**CERN** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

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HUNDRED AND HUNDRED-AND-FIRST SESSIONS OF THE COUNCIL  
Geneva - 16 December 1994 - 10.00 a.m.

Council Chamber

**DRAFT AGENDA**

Documents

1. Report of the Credentials Committee

2. Adoption of the Agenda

CERN/2064/Rev.

**Hundredth Session - Second Part**

3. Approval of the Draft Minutes of the  
Hundredth Session - **Part 1**

CERN/2053/Draft

4. The LHC Project :

- Further Funding Options for the Large  
Hadron Collider and the Long-Term  
Scientific Programme of CERN

CERN/SPC/695  
CERN/CC/2072

- Funding and Approval of the LHC

CERN/SPC/696  
CERN/CC/2071

## Documents

### **Hundred-and-First Session**

5. President's Report
6. Status Report by the Director-General
7. Draft Budget of the Organization for the Forty-First Financial Year 1995  
(Same document as for the September Meetings of the Finance Committee and the Committee of Council) CERN/FC/3715/Draft
8. The Cost-Variation Index for 1995 CERN/FC/3744
9. CERN Pension Fund
  - Adjustment of Pensions CERN/FC/3737
10. Salary Scales for 1993 and 1994 CERN/FC/3731  
CERN/CC/2059
11. Resolution on the Contribution of Greece CERN/2068
12. Resolutions on the Respective Contributions of the Czech Republic, Hungary, Poland and the Slovak Republic CERN/2069
  - Resolution on the Contribution of the Czech Republic CERN/2069/A
  - Resolution on the Contribution of Hungary CERN/2069/B
  - Resolution on the Contribution of Poland CERN/2069/C
  - Resolution on the Contribution of the Slovak Republic CERN/2069/D

## Documents

- |     |  |                              |
|-----|--|------------------------------|
| 13. | Tripartite Employment Conditions Forum<br>(TREF)<br>Report by the Chairman | CERN/FC/3758                 |
| 14. | Staff Policy and Staff Planning  | CERN/FC/3747<br>CERN/CC/2067 |

## CLOSED SESSION

- |     |   |  |
|-----|---|--|
| 15. | Elections:  |  |
|     | - Composition of the Scientific Policy Committee<br>Appointment of one New Member       | CERN/2065<br>(Confidential)                    |
|     | - Election of one of the Vice-Presidents of Council                                     |  |
|     | - Election of a new FC Chairman   |  |
|     | - Re-appointment of one of the Vice-Chairmen of the Governing Board of the Pension Fund | CERN/2066<br>(Confidential)                    |
| 16. | Senior Staff Appointments   | CERN/SPC/692<br>CERN/CC/2058<br>(Confidential) |
|     |   |  |
|     | * * * * *   |  |
| 17. | Report on the Closed Session  |  |
| 18. | Revised Draft Timetable of Council Sessions and Committee Meetings 1995                 | CERN/2056/Draft 2                              |
| 19. | Other Business.   |  |

# MISSING MAGNET MACHINE

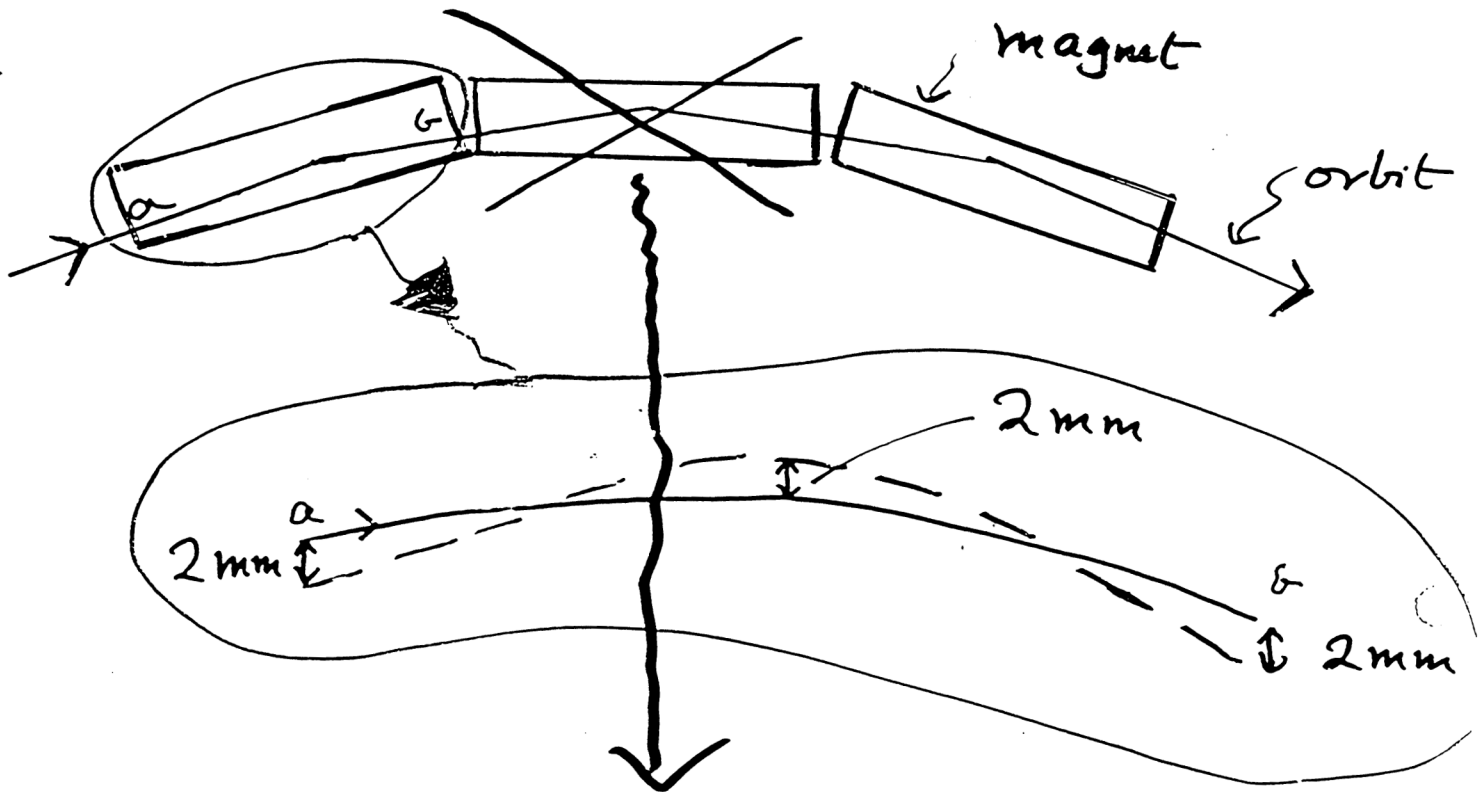
(Item 4 of the Agenda)

by

the Director-General

# Missing Magnet LHC

1



⇒ 9-10 TeV collider

$$L_{\max} = 4 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$$

In phase 1: Save cost of cold mass for  $\frac{1}{3}$  magnets, less testing + tooling, no need to upgrade LEP cryogenics - - - - .

## 2 Physics at 9-10 TeV, $10^{33} \text{ cm}^{-2} \text{ s}^{-1}$ VS 14-15 TeV, $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

- Heavy ions - little change
- b quarks - little change
- top quarks - little change
- $W', Z'$  - 30% less reach
- Supersymmetry - 30% less reach
- Higgs - much worse

⇒ hints for  $M_H \lesssim 400 \text{ GeV}$   
(discovery 200-250 GeV?)

whereas full machine covers  
full range from LEP2 limit to 1 TeV

- no good for dynamical symmetry  
breaking



## DRAFT RESOLUTION ON THE CONTRIBUTION OF GERMANY

COUNCIL,

### CONSIDERING

The request made by the German Delegation in its letter dated 27 November 1992 for a reduction of the German contribution to the CERN Budget, in accordance with Article VII. 1.(b)(ii) of the Convention, and the recommendation of Committee of Council (CERN/CC/1957) dated 17 December 1992;

### CONSIDERING

That Council endorsed the latter recommendation on 18 December 1992 (CERN/1964);

### CONSIDERING

The letter of the German Delegation dated 15 November 1994 relating to the realisation of LHC and the financing of CERN, and the statement of the German Delegation that the special circumstances which justified granting this reduction continue to exist;

### DECIDES

The contribution of Germany to the CERN annual budget shall be calculated in accordance with the rules of the Organisation concerning the scale of the Member State contribution;

Until 31 December 1998, the amount to be paid by Germany shall be maintained at the level of 22.5%. After that date, it shall revert to the ordinary level.

**DRAFT COUNCIL RESOLUTION  
CONCERNING A DOUBLE MAJORITY PROCEDURE  
FOR CERTAIN FINANCE COMMITTEE  
RECOMMENDATIONS TO COUNCIL**

**COUNCIL,**

**CONSIDERING**

The proposal by the Committee of Council that the financial decisions of the Organisation should be satisfactorily supported in terms of budgetary contributions;

The recommendation of the Committee of Council to Council to introduce a double majority procedure, as expressed in Document CERN/CC/1887;

Its Resolution CERN/1902 and the recommendation of the Committee of Council to revise articles 3 and 4 of this resolution;

The CERN basic Convention, in particular Article V;

**DECIDES**

1. A double majority procedure shall apply to the Finance Committee recommendations to Council, whereby in addition to the formal majorities established by the Convention and by the internal Rules of the Organisation, these recommendations shall be based on a majority of the annual financial contributions of the Member States, according to the scale of contributions in force;
2. This procedure shall apply to the recommendations of the Finance Committee relating to the Bannier procedure, the annual Budget and the Cost-Variation Index (CVI);
3. The percentage of contributions applicable for the financial majority of this procedure is set at a level of 70% of the Member States' contributions, according to the scale of contributions in force;
4. This Resolution, which replaces Resolution CERN/1902, shall apply from the date of its approval until the construction of the Large Hadron Collider is completed. Before the end of a period of three years starting from this date, Council shall conduct a review of the operation of this procedure and decide whether it should be modified.

**DRAFT RESOLUTION  
APPROVAL OF  
THE LARGE HADRON COLLIDER (LHC) PROJECT**

**COUNCIL,**

**HAVING REGARD TO**

the Resolution (CERN/1904) it adopted at its 93rd Session on 20 December 1991 stating that the LHC is the right machine for the advance of the subject and for the future of CERN;

**CONSIDERING**

the proposal to construct a Large Hadron Collider with a centre of mass energy of 14TeV in the LEP tunnel (CERN/SPC/679-CERN/CC/2016; CERN/SPC/677-CERN/CC/2014; CERN/SPC/677/Add.-CERN/CC/2014/Add.; CERN/CC/2030; CERN/2039; CERN/SPC/695-CERN/CC/2072, including the budget scenario in Table 2);

the Resolution it adopted at its 99th Session on 15 April 1994, which again endorsed the scientific case for the LHC, supported the promotion of the LHC as the central element of the long-term programme of CERN, expressed a wish that the LHC be implemented as part of the basic programme of the Laboratory, and endorsed the proposed comprehensive review of the progress of the project, to be carried out at an appropriate moment and in any case before the end of 1997 in order to define more precisely the timetable for execution of the project in the light of the foreseen funding;

Articles II, III and V of the CERN Convention;

the Council decision of 21 December 1978 by which the programmes of activities of the Basic Programme were redefined so as to form a single programme of activities (CERN/1323);

the Council Resolution (CERN/1411 (a)) dated 25 June 1981 by which the Council approved the LEP Project as part of the Basic Programme of the Organisation as defined in the document entitled "*Scientific Activities and Budget Estimates 1982-1985*" (CERN/SPC/471 - CERN/FC/2443), so that the Basic Programme presently comprises "*The Proton Synchrotron (PS), the Super Proton Synchrotron (SPS), and the Large Electron Positron Collider (LEP)*";

## CONSIDERING ALSO

document CERN/SPC/696-CC/2071 and the conclusions reached by the Committee of Council on 15 December 1994;

## DECIDES

- a) to include the Large Hadron Collider (LHC) project in the Basic Programme of the Organisation, which will then consist of the Proton Synchrotron (PS), the Super Proton Synchrotron (SPS), the Large Electron Positron Collider (LEP), and the Large Hadron Collider (LHC);
- b) that on the basis of current planning and expected income, the Large Hadron Collider (LHC) will be constructed in two phases;
- c) to approve the Basic Programme as thus modified;
- d) to approve the annexed Statement concerning the Funding and Approval of the Large Hadron Collider (LHC).

## STATEMENT CONCERNING THE FUNDING AND APPROVAL OF THE LARGE HADRON COLLIDER (LHC)

The CERN Council

- 1) Declares that the decision to include the LHC in the Basic Programme constitutes full approval to construct a 14TeV collider, although on the basis of current planning and expected income, this would have to be accomplished in two stages.
- 2) Declares that any non-Member State contributions would be used to speed up and improve the project, not to allow reductions in Member States' contributions.
- 3) Notes with gratitude the commitments of France and Switzerland to make voluntary contributions to help and accelerate the LHC project.
- 4) Declares that the overall Cost Variation Index to be applied to the Member States' contributions should be zero in the period 1995-1997.
- 5) Decides that planning should proceed on the basis of the assumption that inflation will be 2% and that Member State contributions will be indexed by 1% from 1998 onwards.
- 6) Agrees that the comprehensive review of the progress of the LHC project, to be carried out before the end of 1997, will examine the question whether the LHC should be constructed in one stage instead of two.

## GENERAL STATEMENT BY FRANCE

(Item 4 of the Agenda)

by

Mr P. Vimont

15 décembre 1994

## DÉCLARATION GÉNÉRALE DE LA FRANCE

1. La France a la volonté d'aboutir à partir des propositions du Directeur général du CERN et après avoir entendu l'ensemble des pays pour le règlement de l'ensemble des points techniques en discussion;
2. La France confirme l'effort exceptionnel pour la construction du LHC, de 64,5 MFS, dans les termes indiqués par F. Fillon dans sa lettre au CERN du 16 septembre 1994;
3. Il est demandé à la France si elle peut envisager d'indexer sa contribution à compter de 1998 selon l'hypothèse retenue dans le plan du Directeur général, pour améliorer le projet.

La réponse est oui, et la France espère que d'autres pays pourront la rejoindre, puisqu'en juin dernier ceux qui avaient alors marqué leur accord, l'avaient fait sur la base d'une indexation intégrale.

L'important est de ne pas perdre de vue l'objectif scientifique essentiel, rappelé par le Directeur général, qui est de décider de construire le LHC.

# STATUS REPORT BY THE DIRECTOR-GENERAL

(Item 6 of the Agenda)



# CERN 1994

1

1) Background - problems in particle physics

2) Highlights of the programme

- PS complex
  - machine
  - 2 ISOLDE expts
  - 2 LEAR expts
  - Energy ampli.

- SPS
  - machine
  - neutrino oscillation expts
  - Spin Muon Collaboration
  - heavy ions
    - beams
    - expts

- LEP
  - LEP1
  - machine
  - precision measurements
  - B physics
  - LEP2.

- LHC.

3) **World Wide Web** - an example of spin-off

# STANDARD MODEL

fits all (?) data

but is incomplete and -> many questions

## CONSTITUENTS

- 6 conventional Leptons
- 6 conventional Quarks

top: LEP indirect  
LHC direct

CHORUS, NOMAD

✓  $\nu$  masses?

- CP violation in

↑ mass matrix?

CLEAR, NA48, LHC

CPT: PS 196

connection?

why 6?

substructure?

LHC

unconventional?

## FORCES

- Strong/nuclear

LEAR, SMC

QCD

- full understanding?

quark - gluon plasma?

SPS Heavy ions, LHC

- Electro-weak

-  $M_W \neq M_Z \neq M_\gamma = 0$ ?

Higgs .... or what?

LEP2, LHC

- Gravity

- quantum theory?

Unified?

New forces?

LHC

Connection?

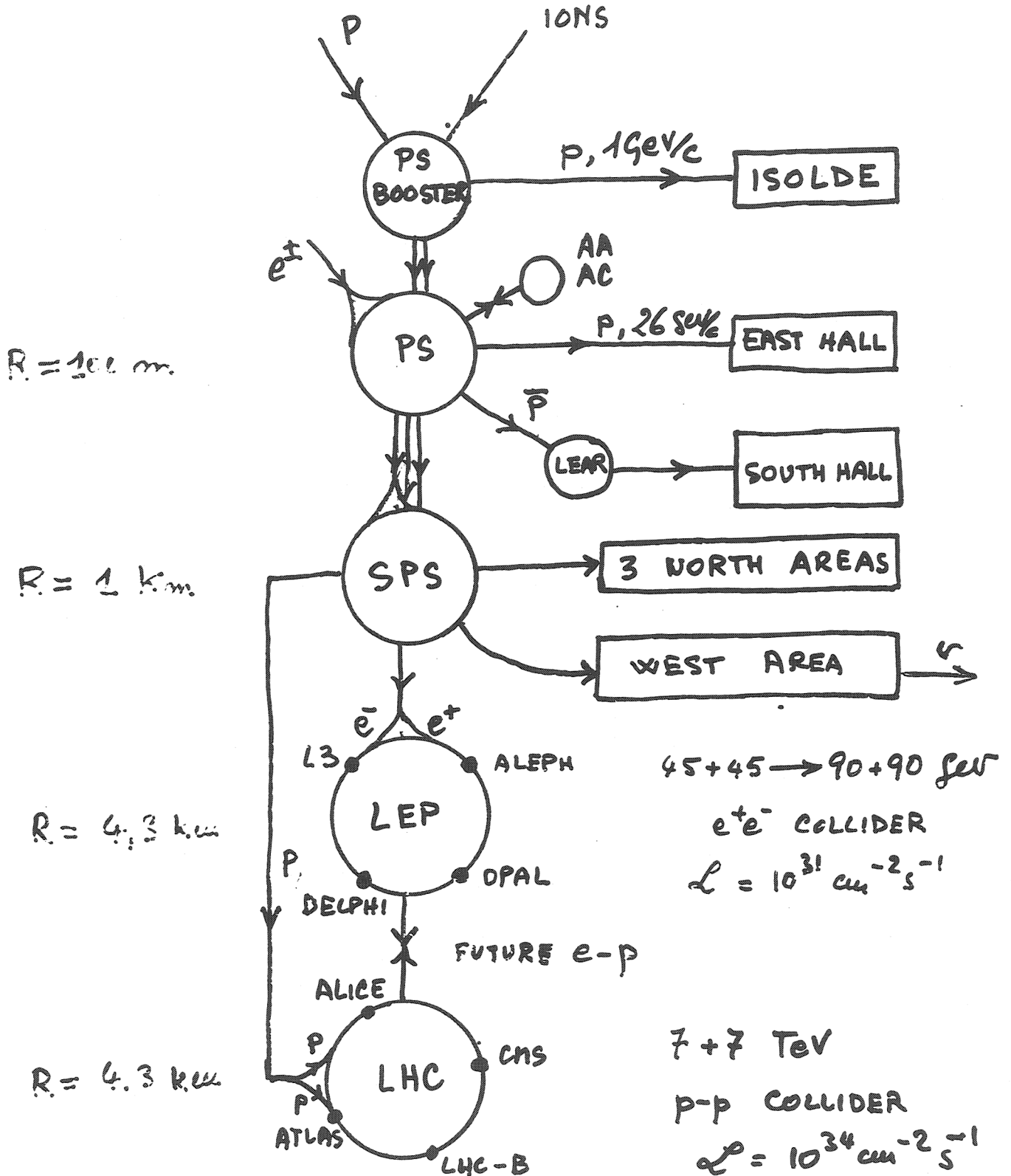
Supersymmetry?

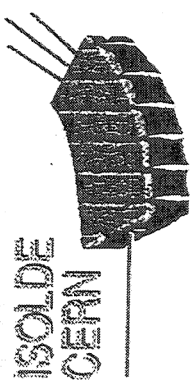
LEP2

LHC

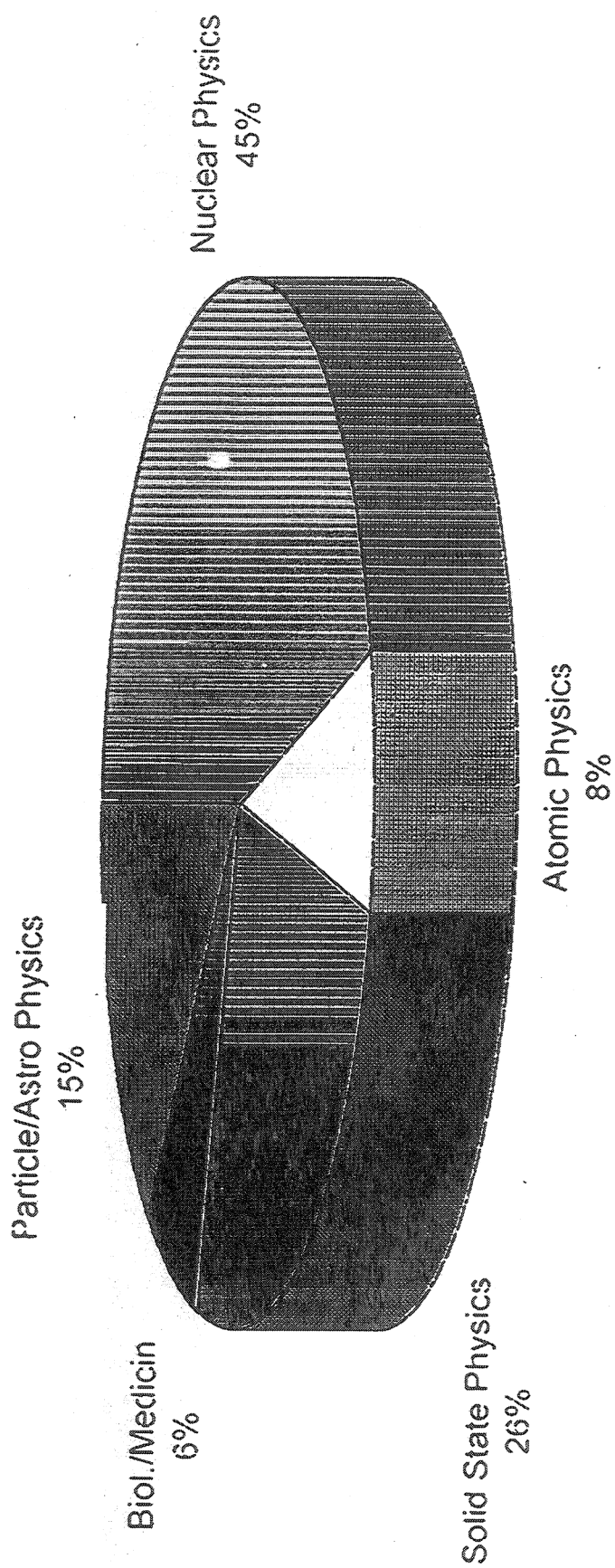
# CERN ACCELERATORS

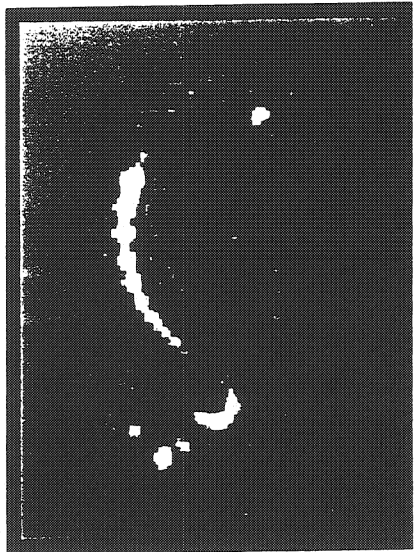
3





## ISOLDE Physics program 1992-1994





PET

**$^{142}\text{Sm}$  EDTMP**

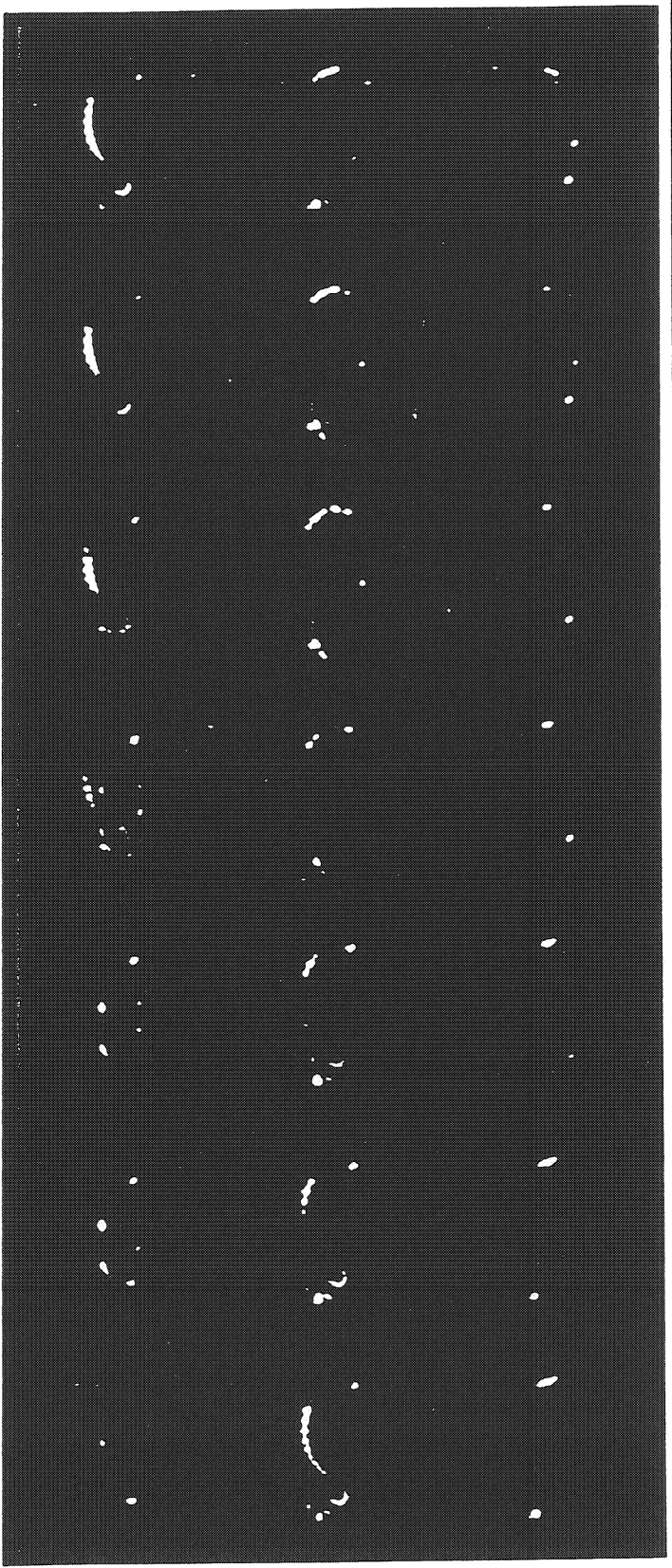
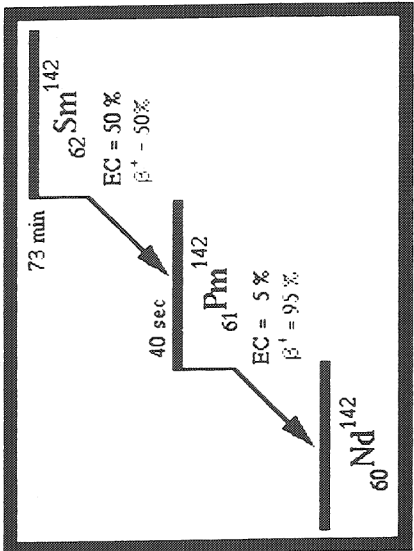
Rabbit, 2h post injection

Scan performed at:

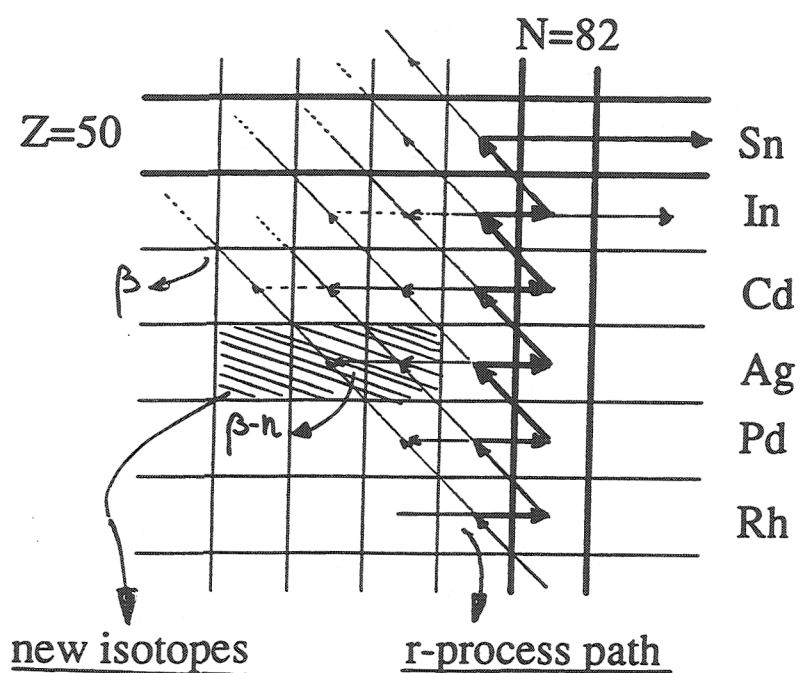
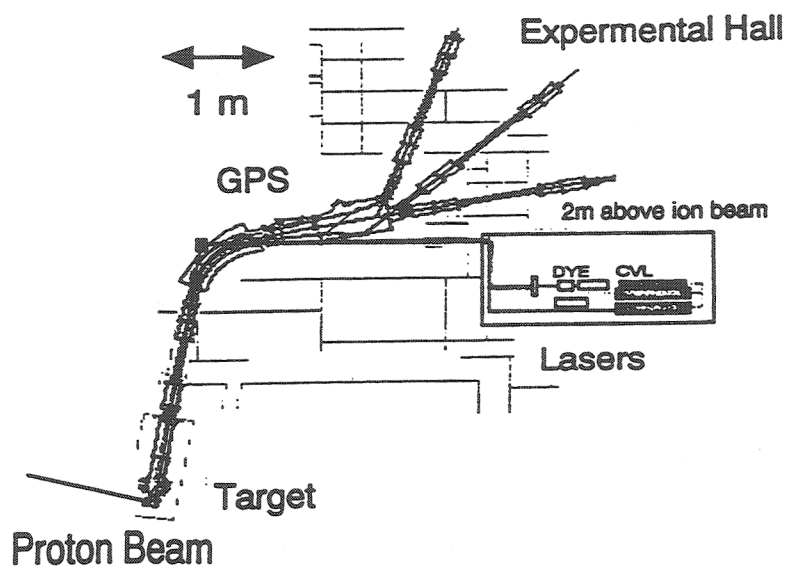
**RPT HCU GENEVA**

$^{142}\text{Sm}$  production at:

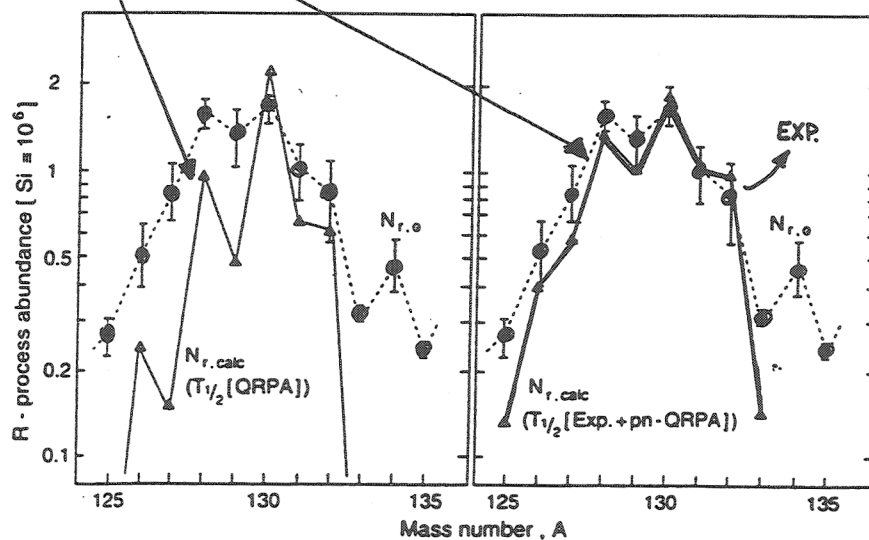
**CERN - ISOLDE**



# ISOLDE LASER ION SOURCE



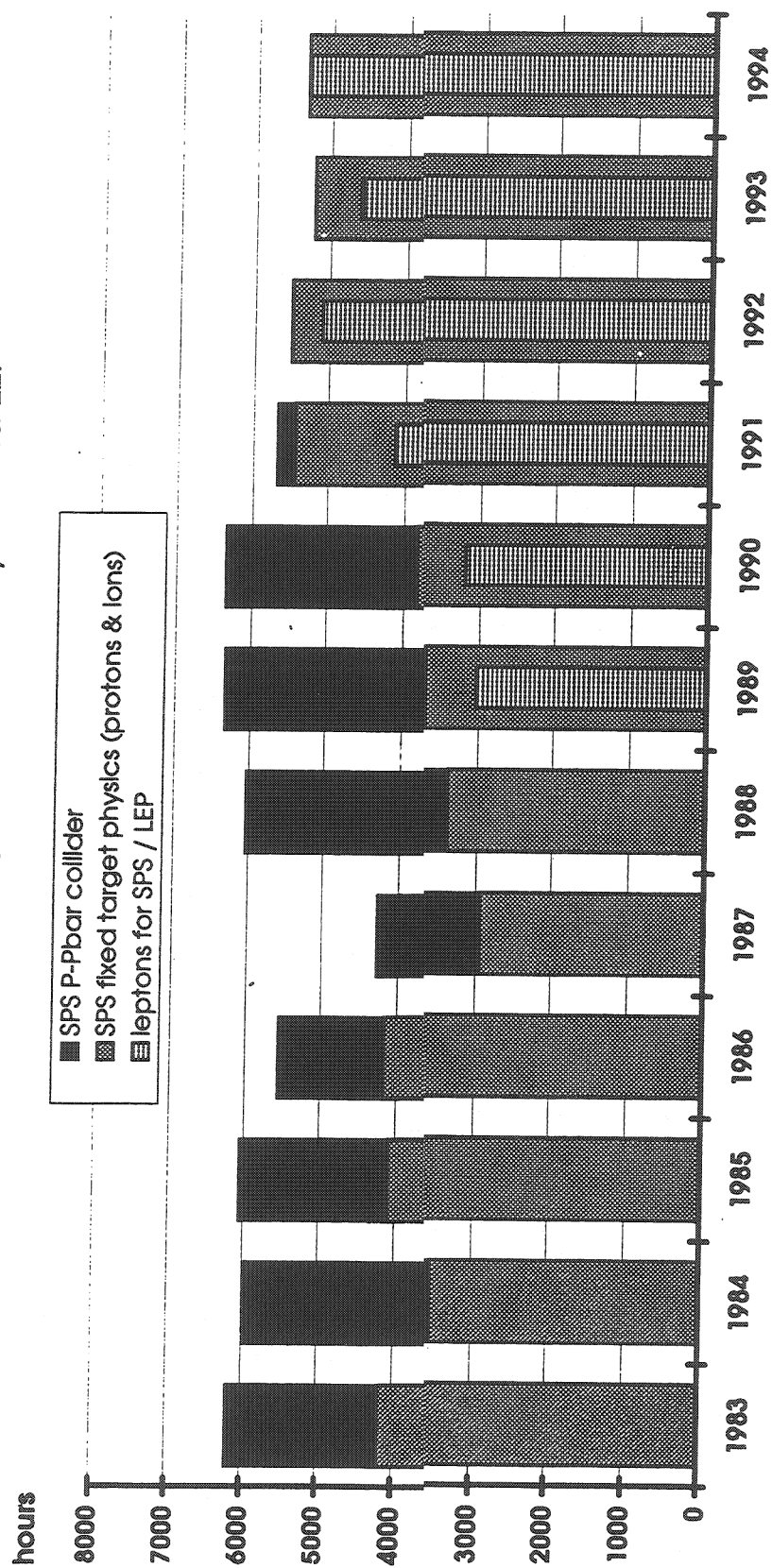
without - with experimental  $T_{1/2}$  and neutron branching ratio





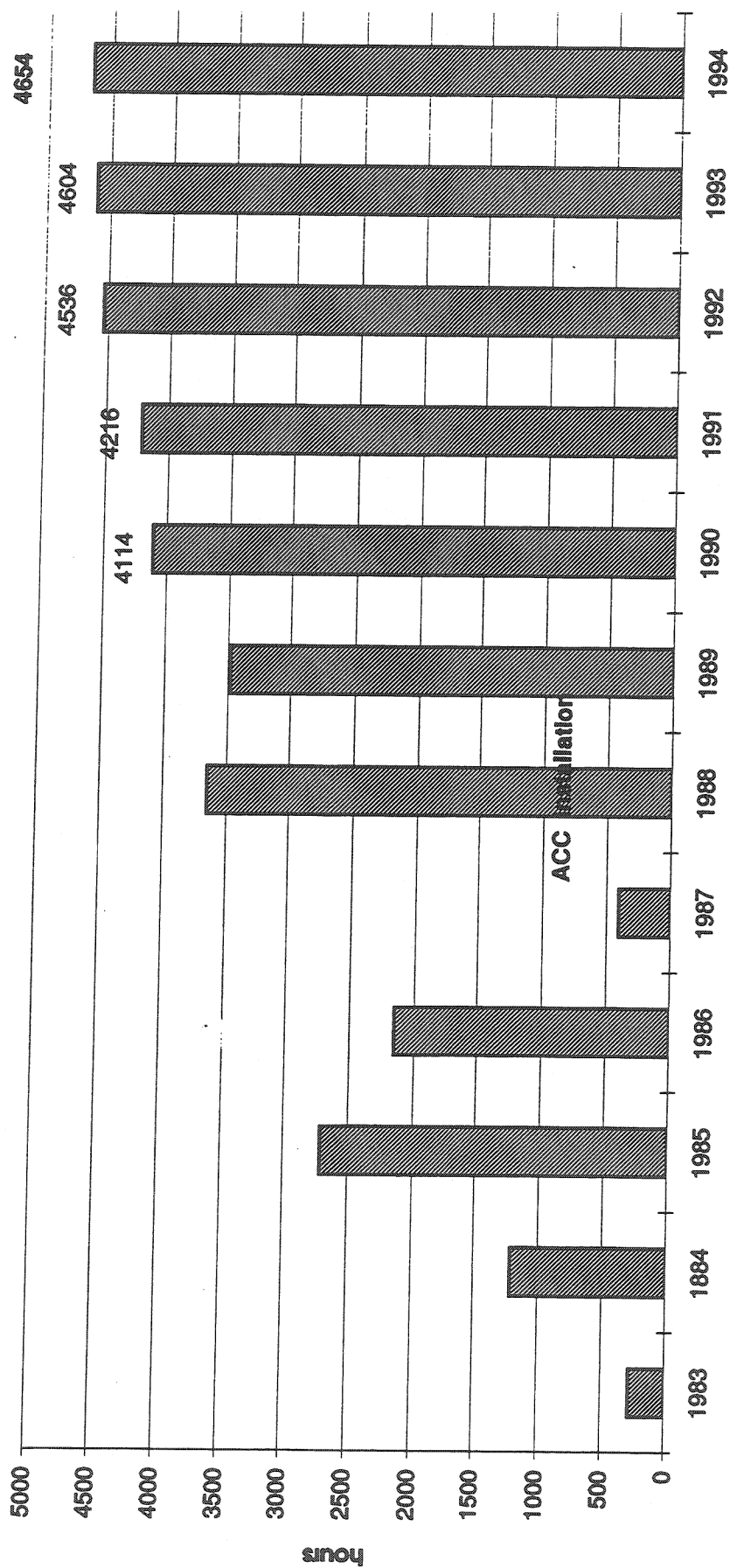


# PS Complex - Running hours for SPS Physics and LEP



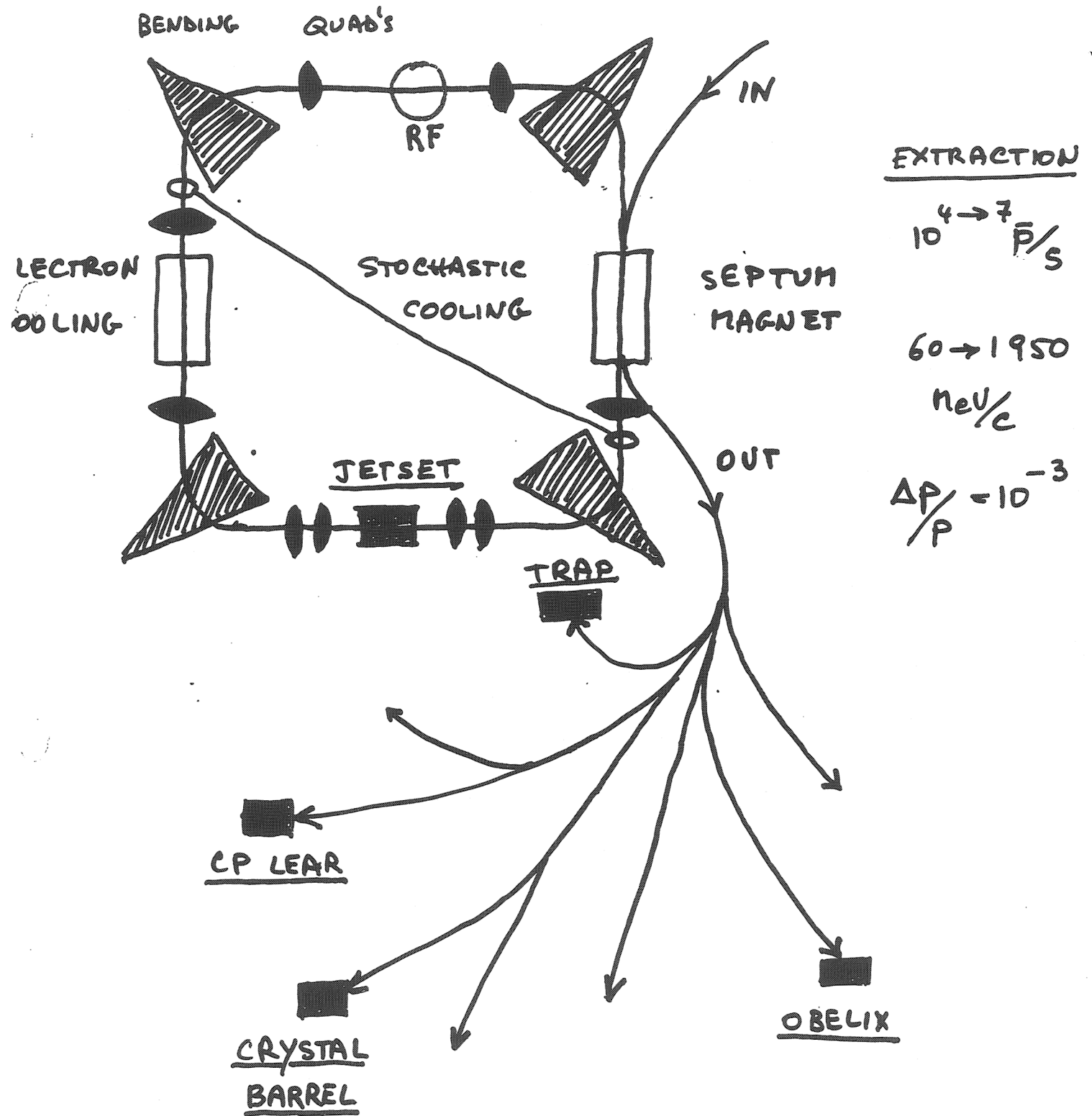


LEAR - Hours scheduled for physics 1983 - 1994

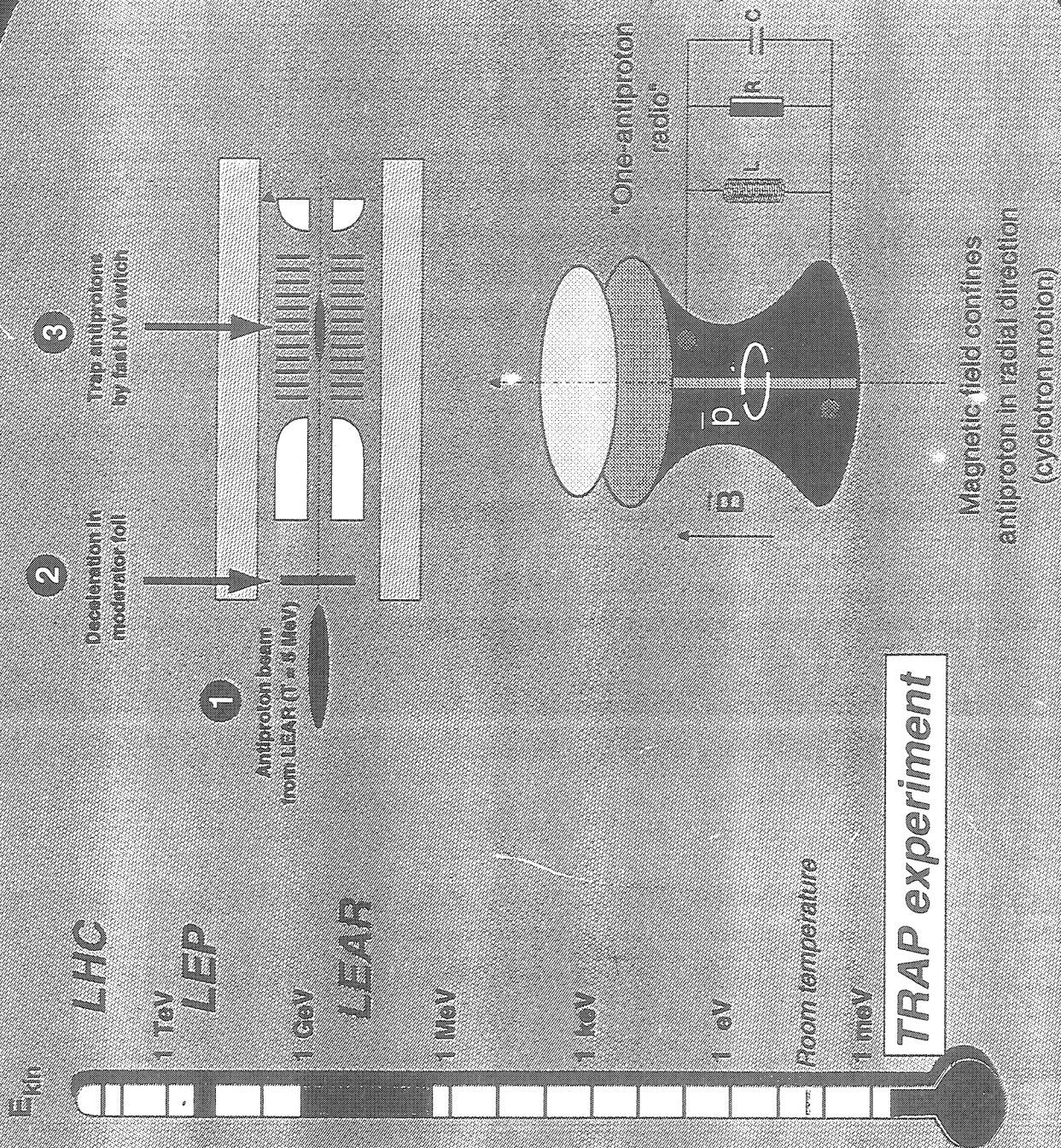


# LEAR

(LOW ENERGY ANTIPROTON RING)



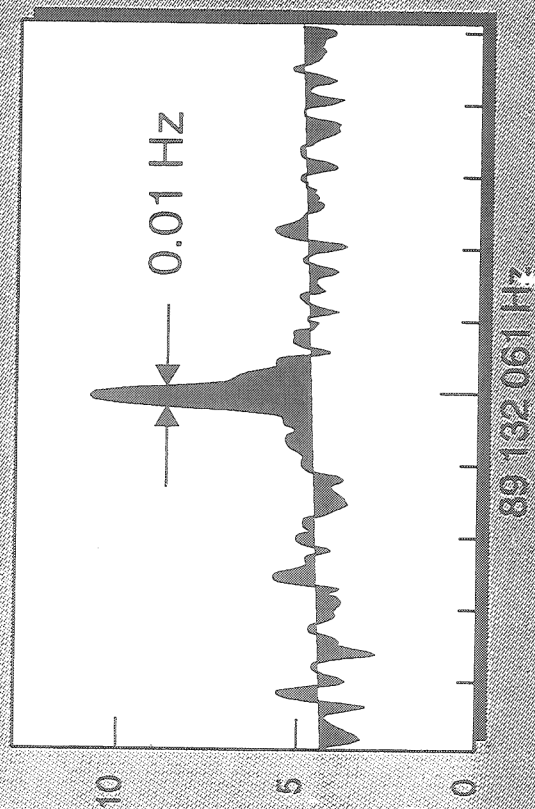
# Results from LEAR





# Results from LEAR

*Cyclotron Frequency*



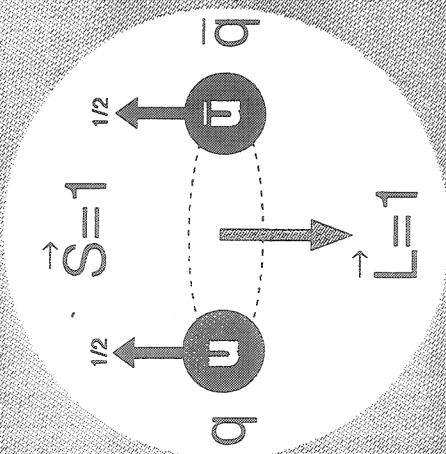
$$\begin{aligned} M(\bar{p}) &= 1.000\,000\,000\,1 \\ M(p) &\pm 0.000\,000\,001\,6 \end{aligned}$$

Inertial Mass of Proton  
is equal to the  
Inertial Mass of the Antiproton  
within 1 part in a billion



# Results from LEAR

"Scalar" meson ( $J=0$ )



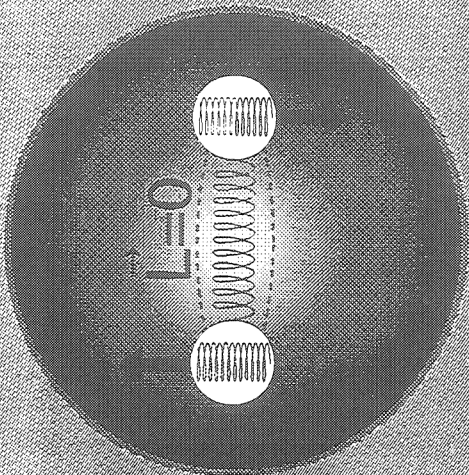
u d s  
u d s

3 x 3 = 9 combinations

3  
+1  
+1  
+4

= 9 "ordinary mesons"

GLUEBALL

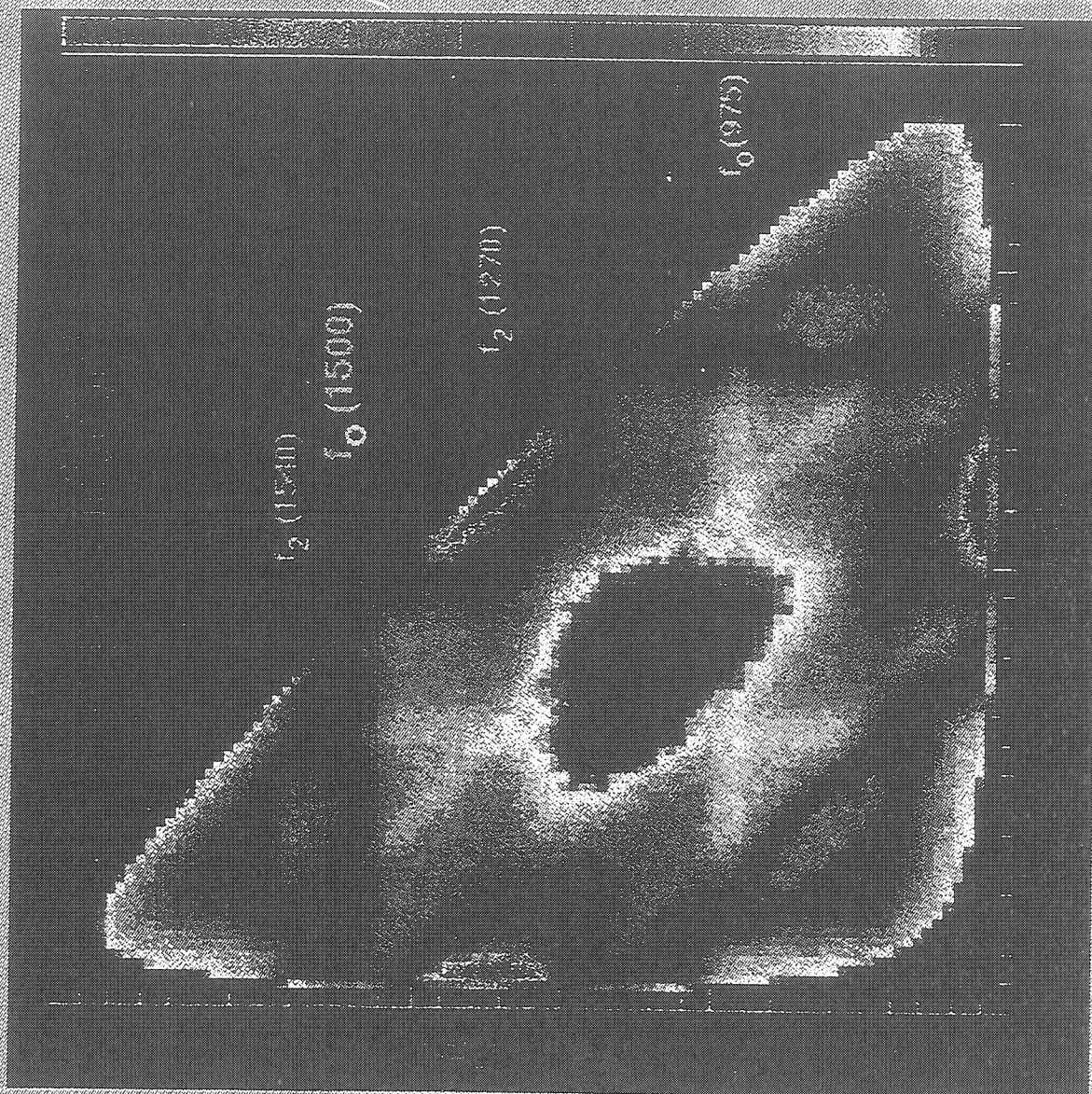


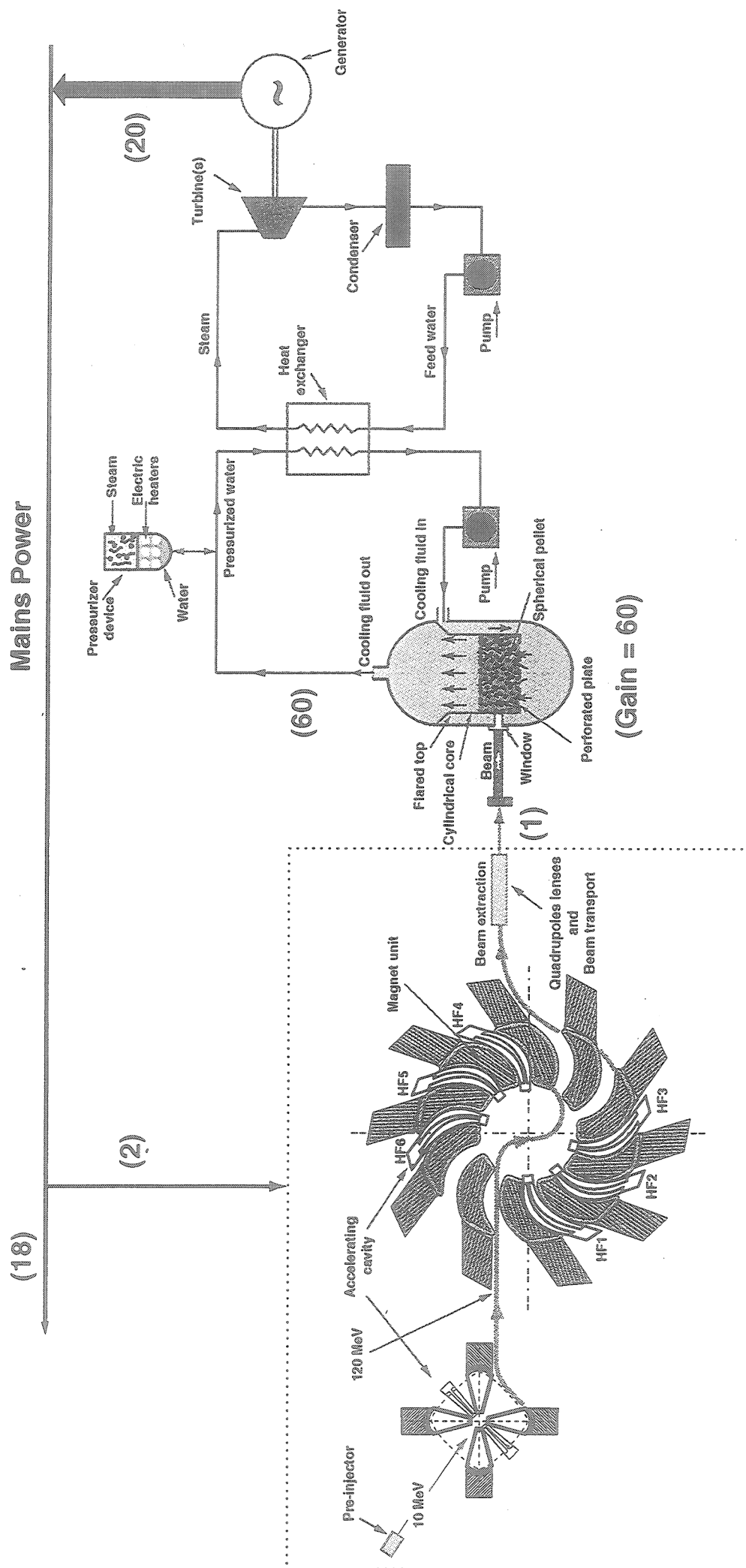
$I=0$  :  $f_0(1500)$   $\rightarrow \pi\pi, \eta\eta, \eta\eta'$  LEAR  
 $f_0(1590)$   $\rightarrow \eta\eta, \eta\eta', 4\pi$  GAMS



# Results from LEAR

## Glueball Search



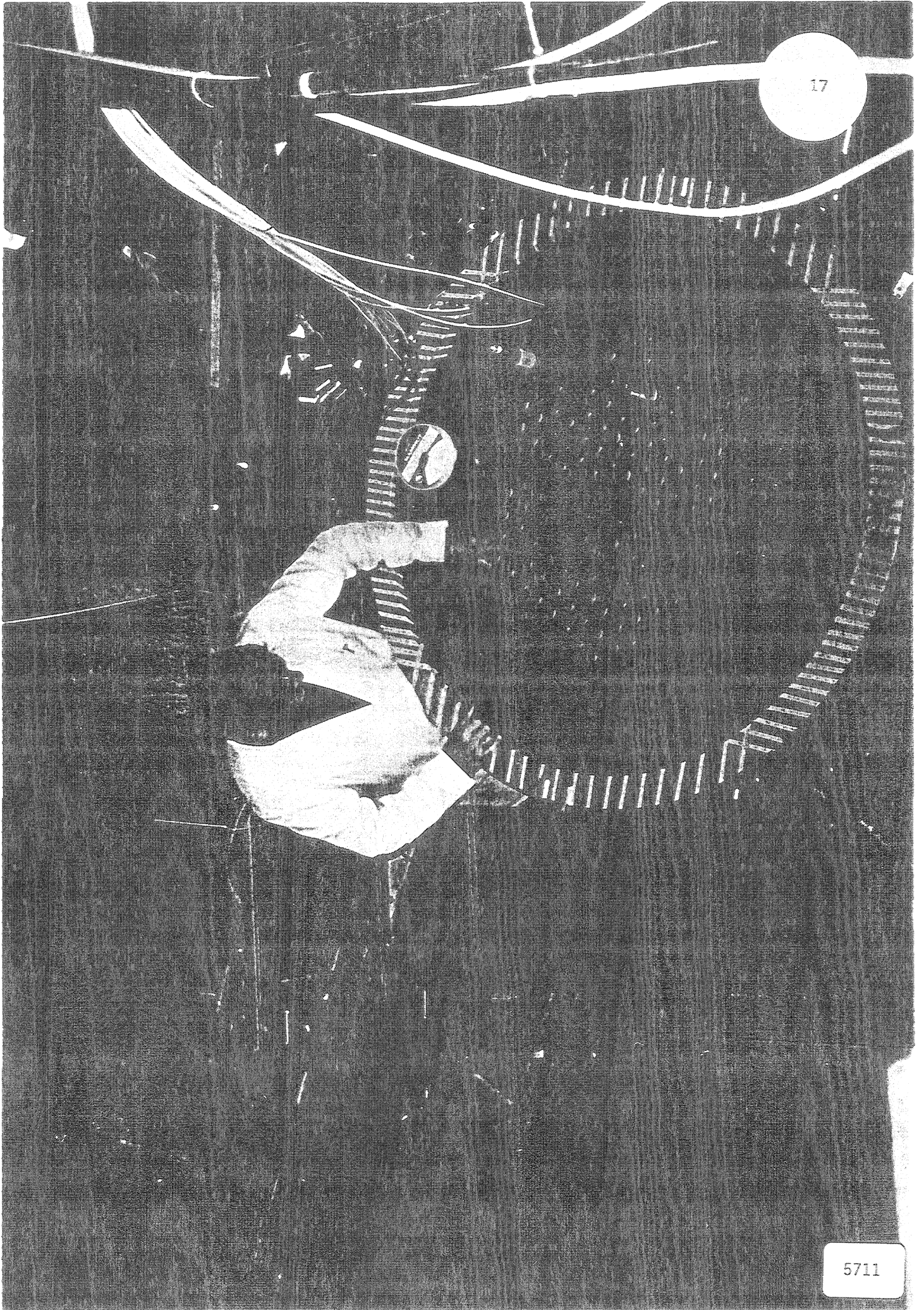


The Energy Amplifier Scheme

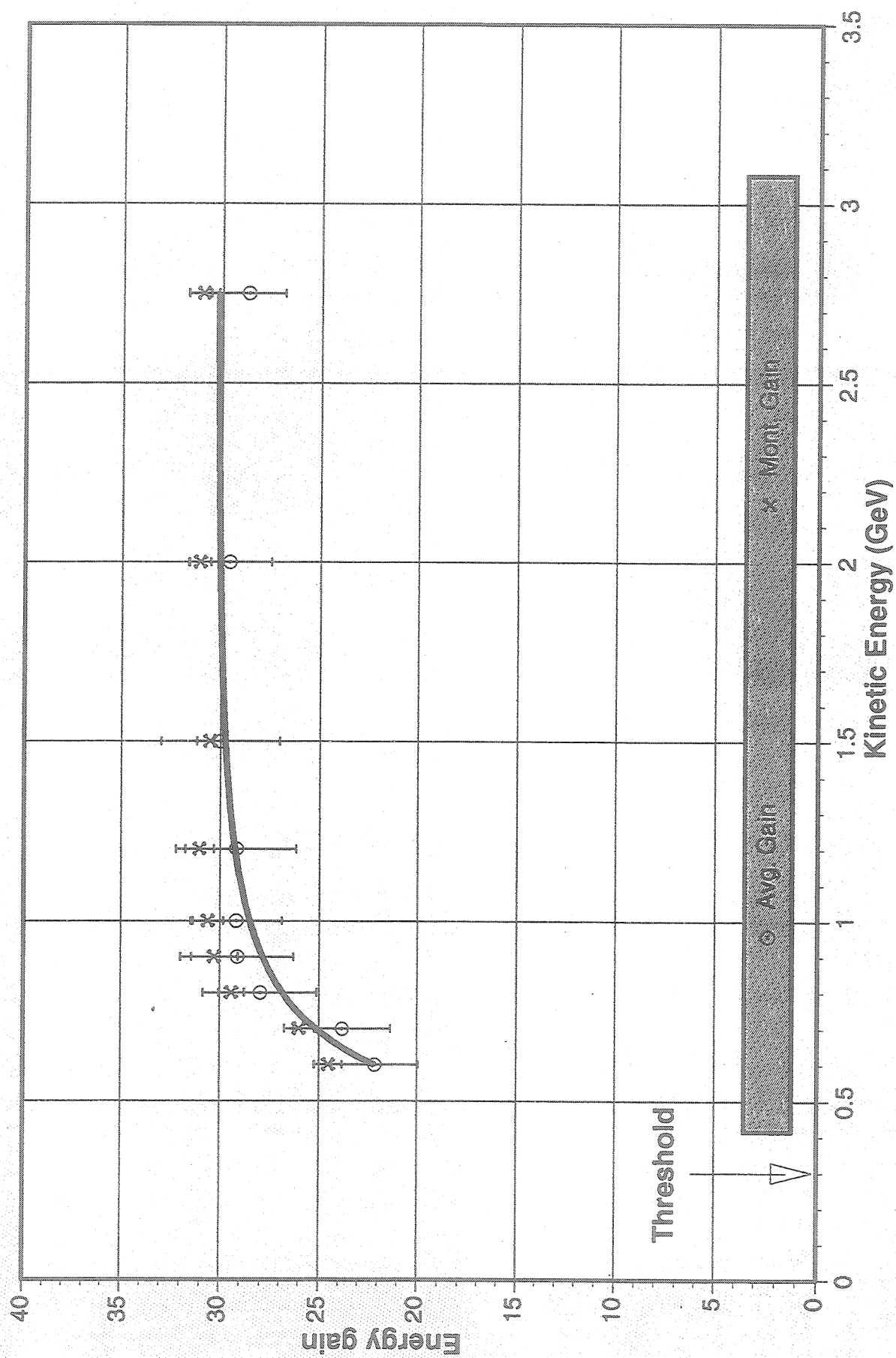
## ADVANTAGES OF THE LOW FLUX, DECAY DOMINATED THORIUM REGIME

- ☛ **Simple** : The fuel is sealed at all times and lasts for a long time. No isotopic separation of fuel, except may be for start-up.
- ☛ **State of the art**: No major technological barriers. A modest 1 GeV,  $\leq 10$  mA cyclotron can drive a 300 MWt station and all previous experience on reactors can be re deployed.
- ☛ **Safe**: no criticality. Melt-down can be avoided with passive cooling (smaller).
- ☛ **Clean(er)**: Long term waste  $< 1/10000$  of a PRW. Actinides are the needed and recycled "seed". Fission fragment radioactivity is strong but much more short-lived. They can be "cleansed" easily with an additional device.
- ☛ **Non proliferating**: No appreciable Plutonium or trans-uranic waste is produced. Uranium seeds contain a very awkward mixture of U232, U234, U235, U236 and highly radioactive U232 from n-2n reactions. Nobody in his right mind will make a bomb with such a mixture!
- ☛ **Inexhaustible**: There is plenty of Th on Earth and it is used 140 times more efficiently than Uranium in which only U235 is burnt





**Energy gain vs. beam kinetic energy**  
(Average from all counters & MonteCarlo)



# SPS 1994

## Protons

- Running with highest possible intensity all year
- Peak of  $3.9 \cdot 10^{13}$  in one SPS cycle achieved
- Mean of  $3.5 \cdot 10^{13}$  per cycle achieved during one day
- Very sensitive to quality of incoming beam
- Over  $8 \cdot 10^{18}$  protons delivered to target T9 for neutrino physics
- Beam availability for physics around 63%

1) WITH PROTONS:

- SEARCH FOR  $\gamma$  OSCILLATIONS (2)  
(CHORUS, WA95)(NOHAD, WA96)
- SPECTROSCOPY (3) (WA89, WA91, WA92)  $\Omega$   
hyperons /  $\Xi$  /  $\tau_{b,c}$
- CP VIOLATION (1) (NA48)  
 $\epsilon'/\epsilon$  FROM 96/97  $\rightarrow$
- $\vec{\mu}$  DEEP INELASTIC SCATTERING ON  $\vec{p}$  AND  $\vec{n}$   
(NA47)

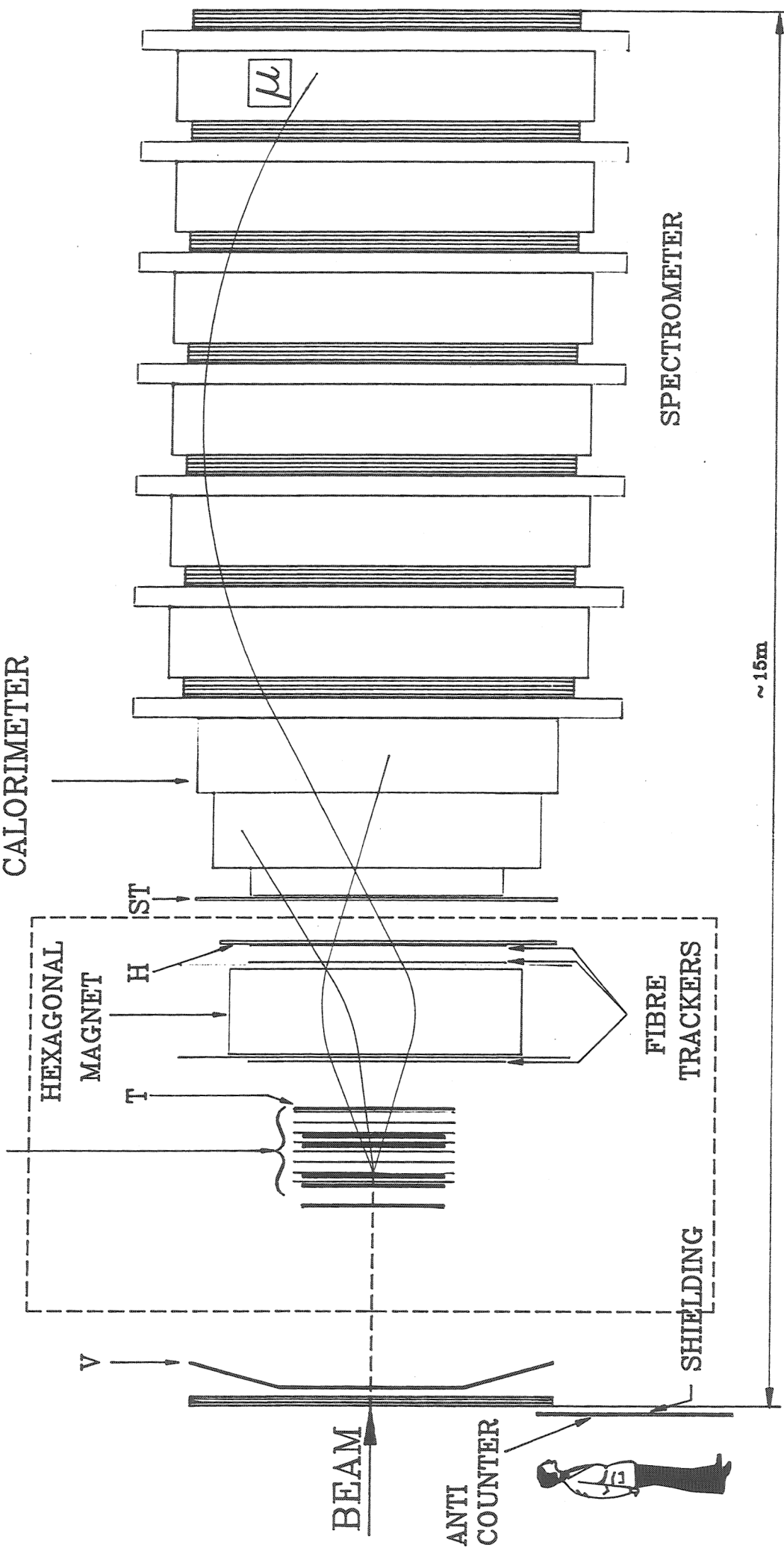
 2) WITH LEAD IONS (FROM 1994)

SEARCH FOR QUARK-GLUON PLASMA (6)  
(WA 93, WA97, NA44, NA45, NA49, NA52)

# CHORUS

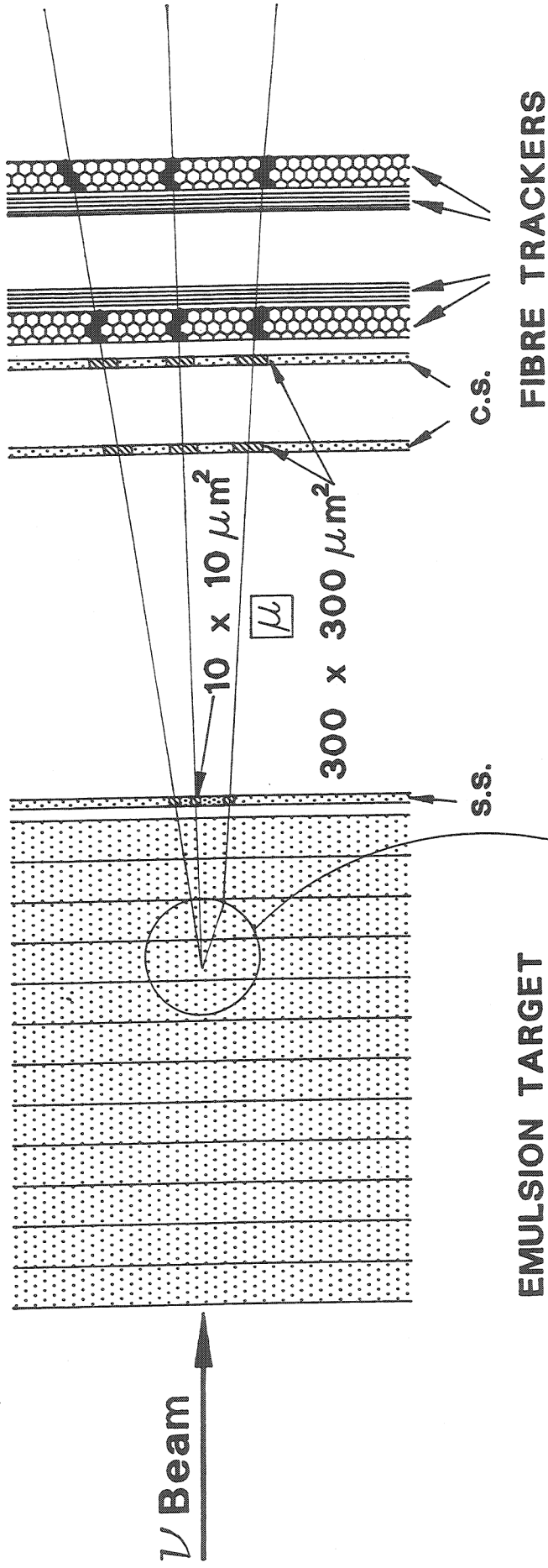
EMULSION TARGETS  
AND FIBRE TRACKERS

HIGH RESOLUTION  
CALORIMETER



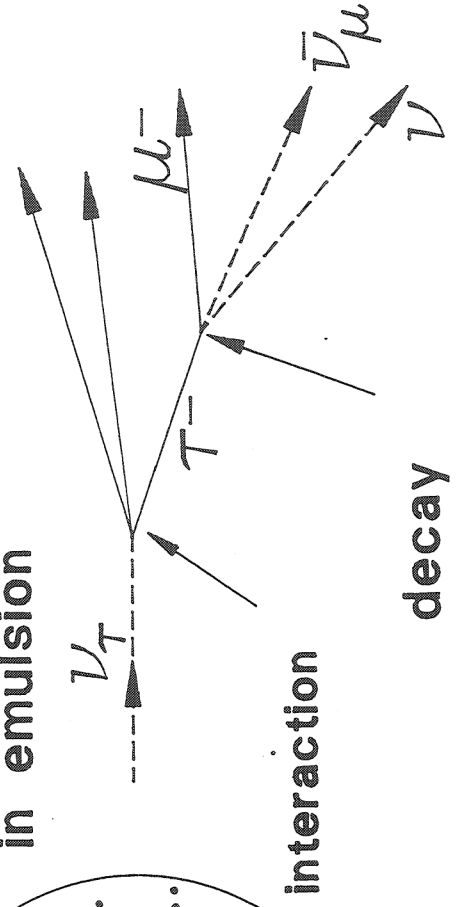
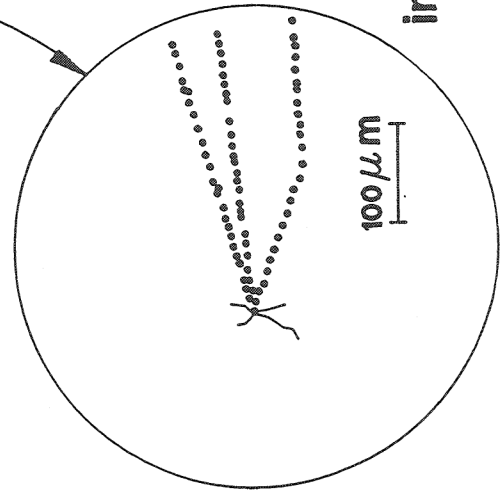


CHORUS



View of  
microscope

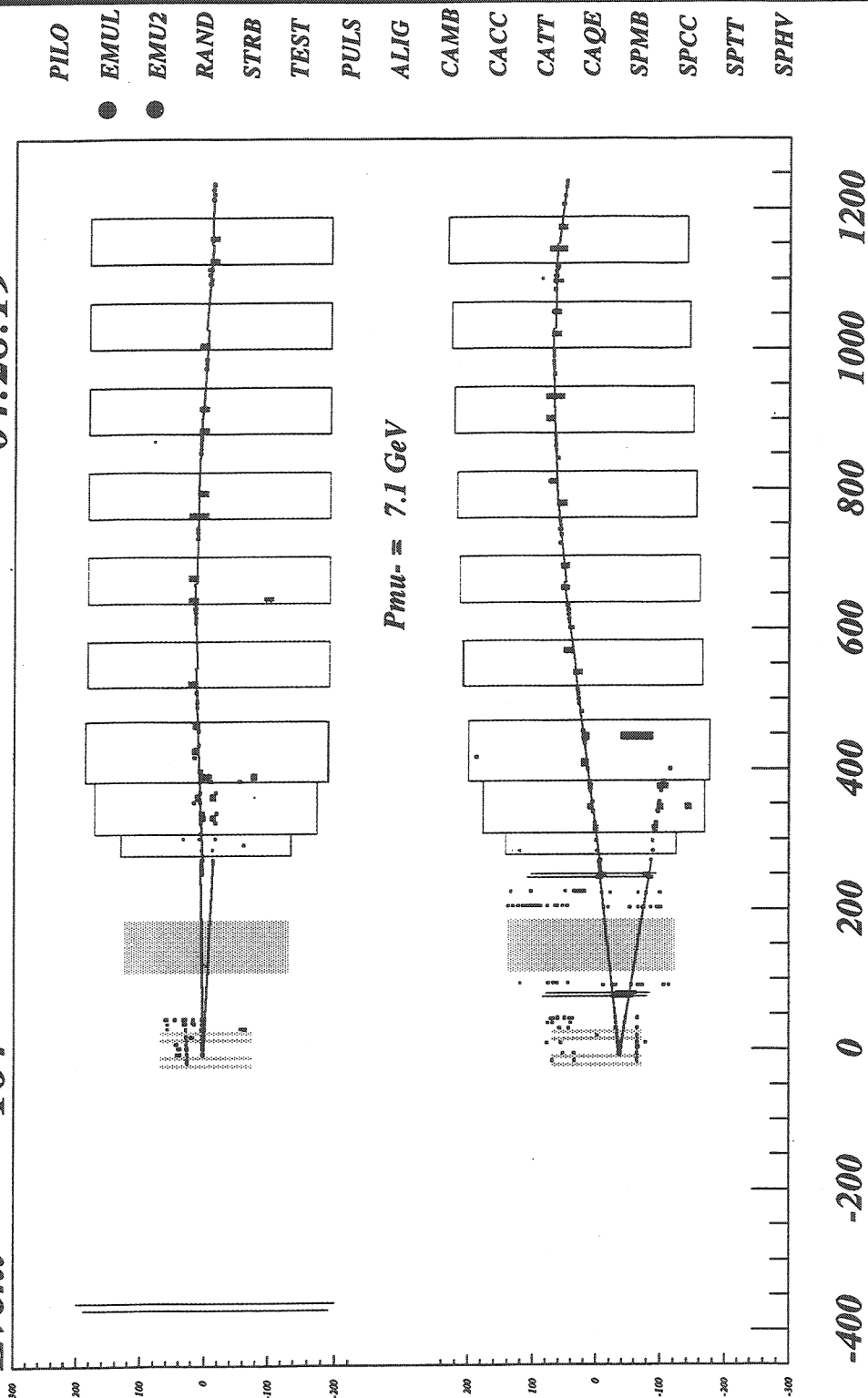
Interaction  
of tau-neutrino ( $\nu_\tau$ )  
in emulsion

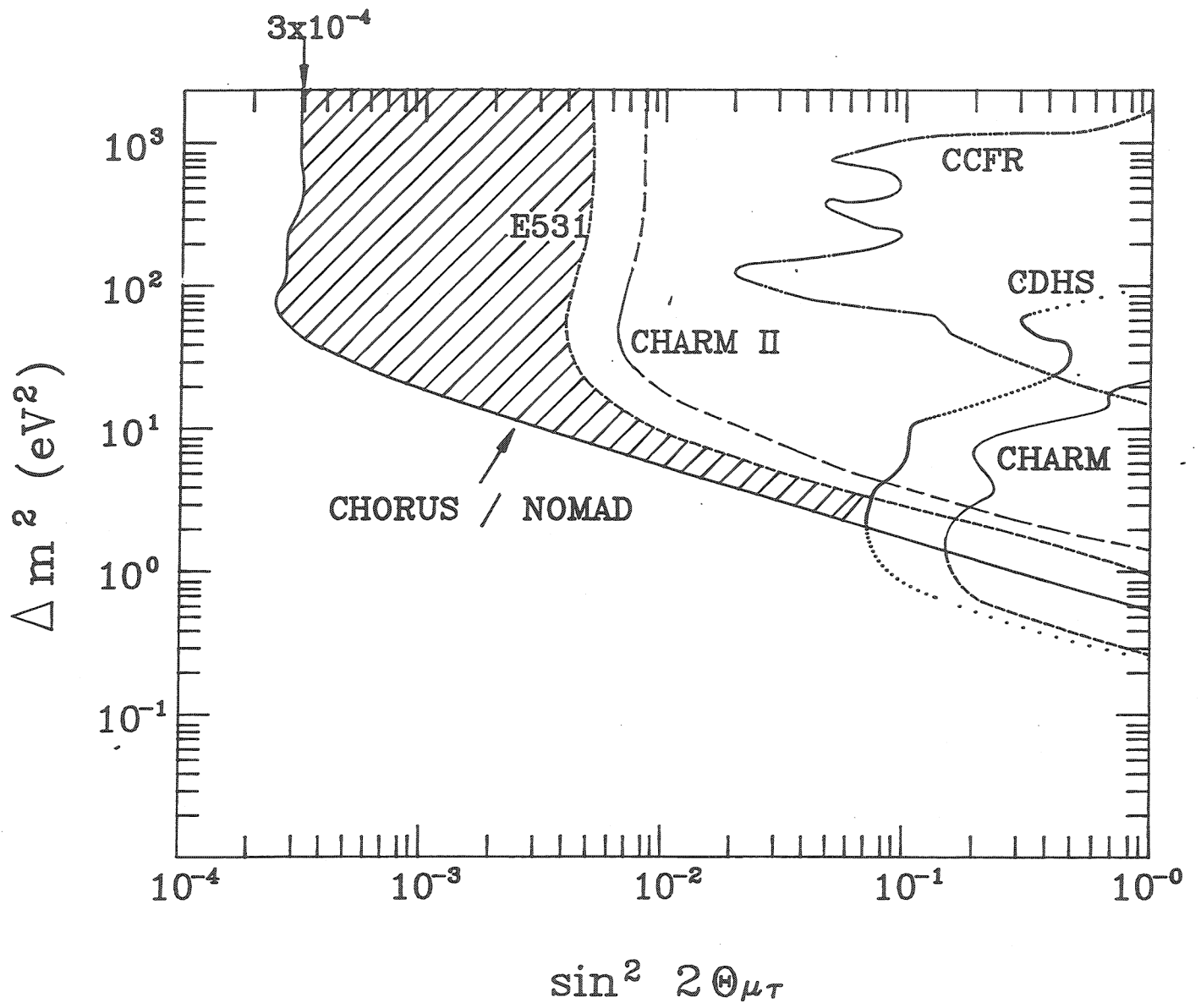


# CHORUS

Run 1386  
Event 164

23/08/94  
04:28:19







DEEP INELASTIC SCATTERING OF  
POLARIZED MUONS ON POLARIZED  
TARGETS TO STUDY THE INTERNAL  
SPIN STRUCTURE OF THE NUCLEON

## MAIN 1994 RESULTS:

■ IMPROVED TEST OF BROKEN SUM RULE -  
FUNDAMENTAL TEST OF QUARK-PARTON  
MODEL - GOOD AGREEMENT

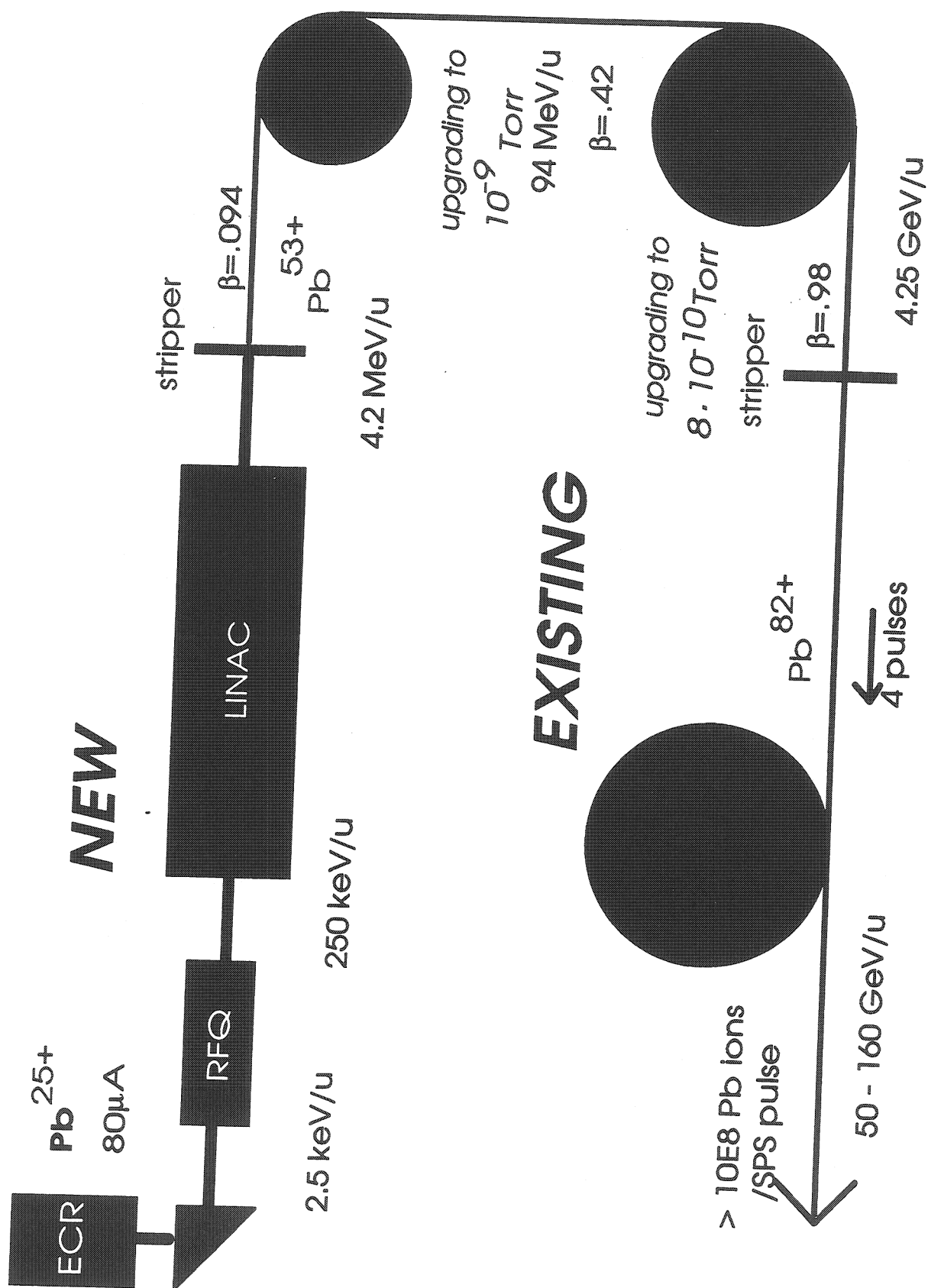
■ MEASUREMENT OF QUARK  
CONTRIBUTIONS TO NUCLEON  
SPIN

● TOTAL QUARK CONTRIBUTION SMALL

$$\Delta \Sigma = 0.22 \pm 0.14$$

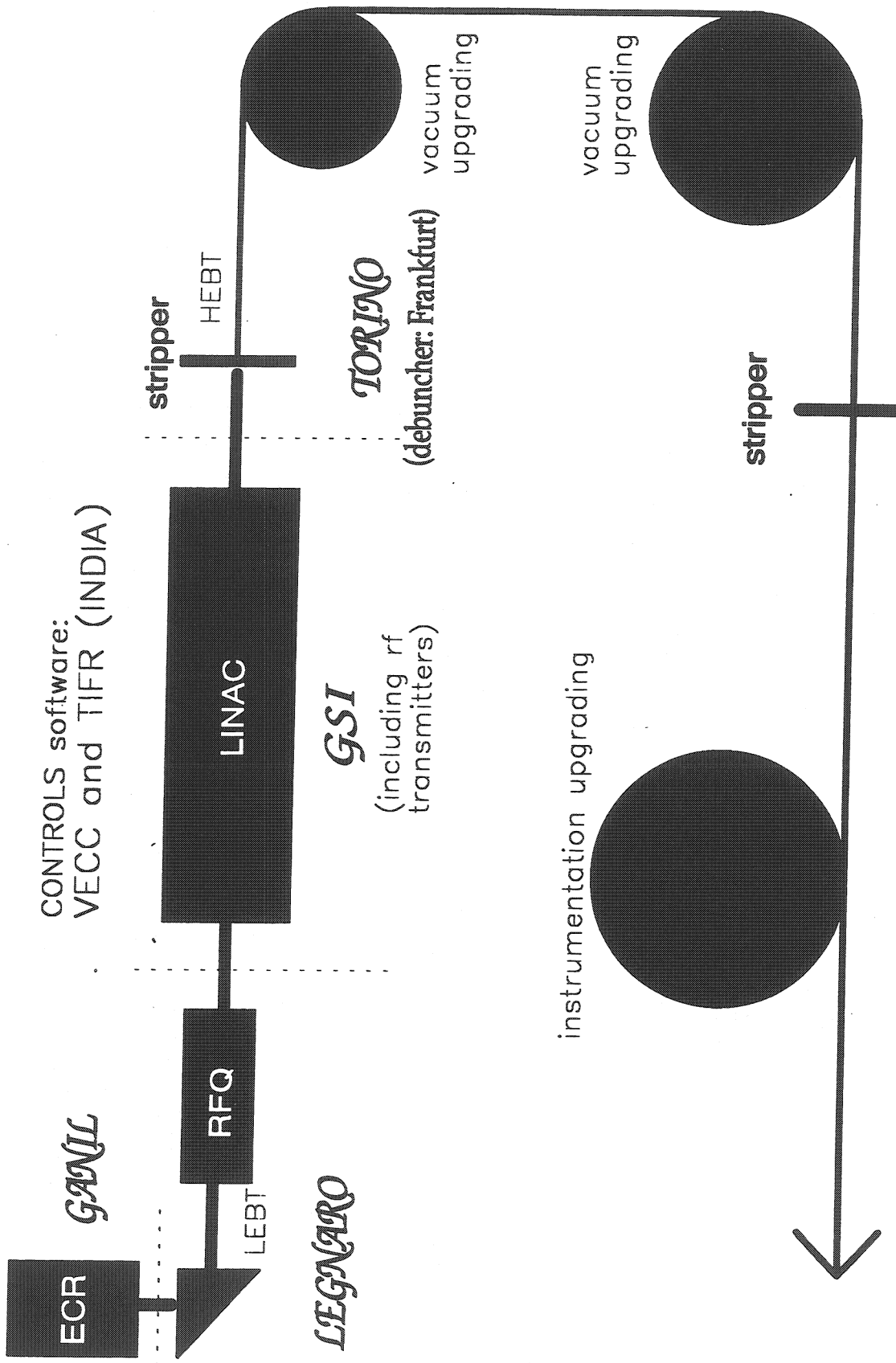
● STRANGE SEA NEGATIVELY POLARIZED

$$\Delta S = -0.12 \pm 0.06$$



# Pb Ion Accelerating Facility at CERN

H. Haseroth, 6/6/94



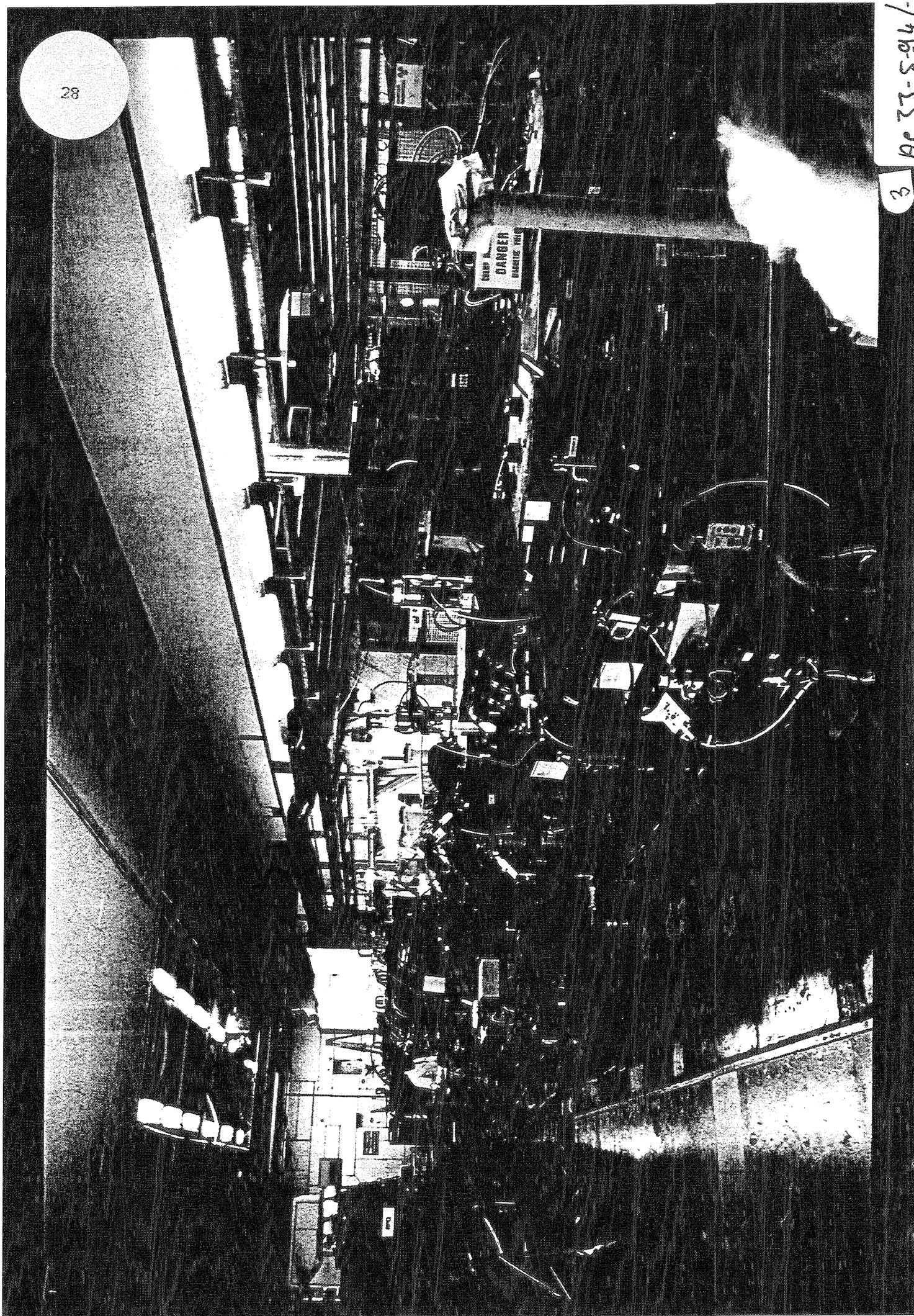
Collaboration of labs in France

Italy, Germany and India

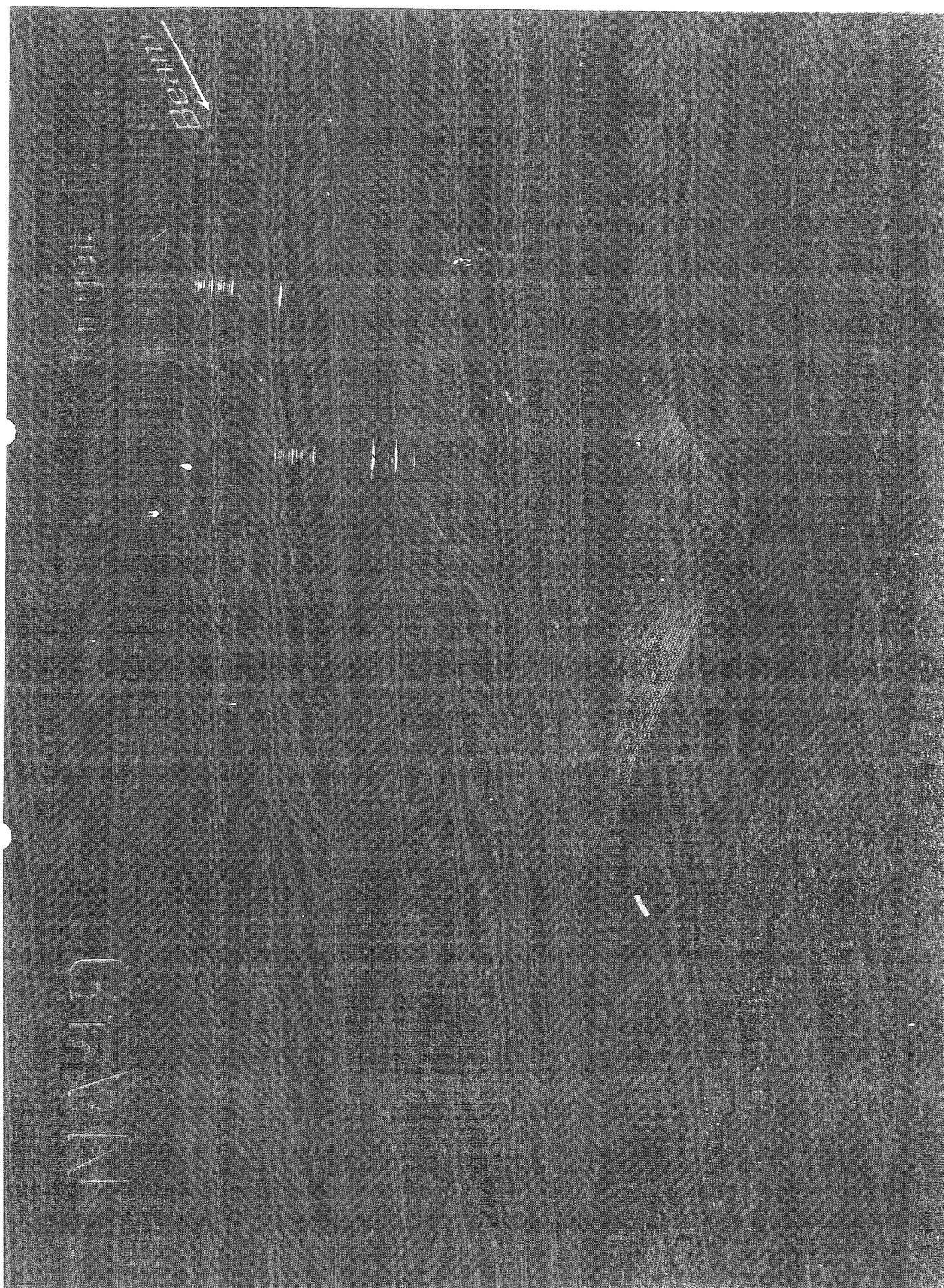
Financial contributions from Sweden and Switzerland

Manpower help from Czech Republic

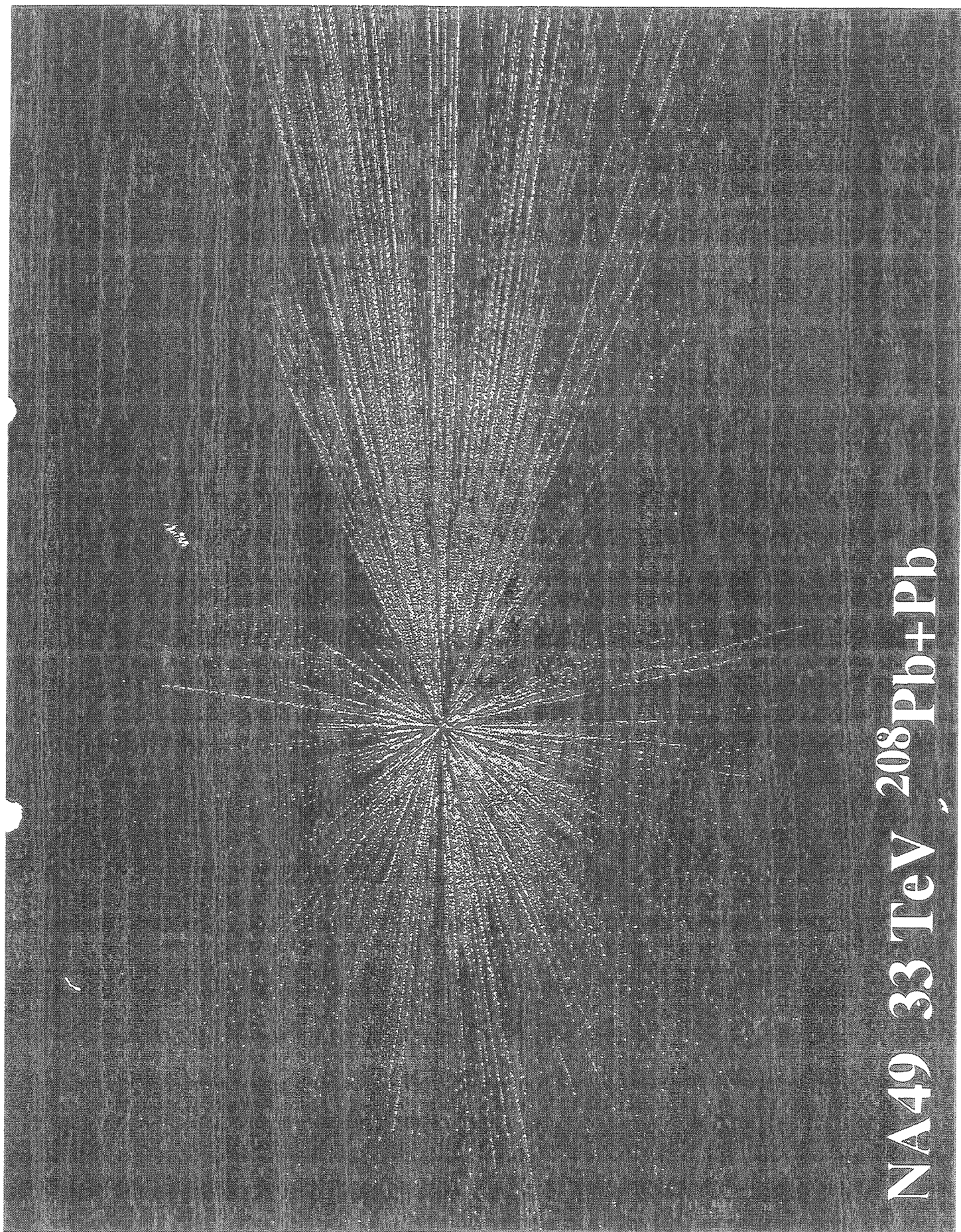
**Pb ion Accelerating Facility at CERN** H. Haseroth, 22/10/93





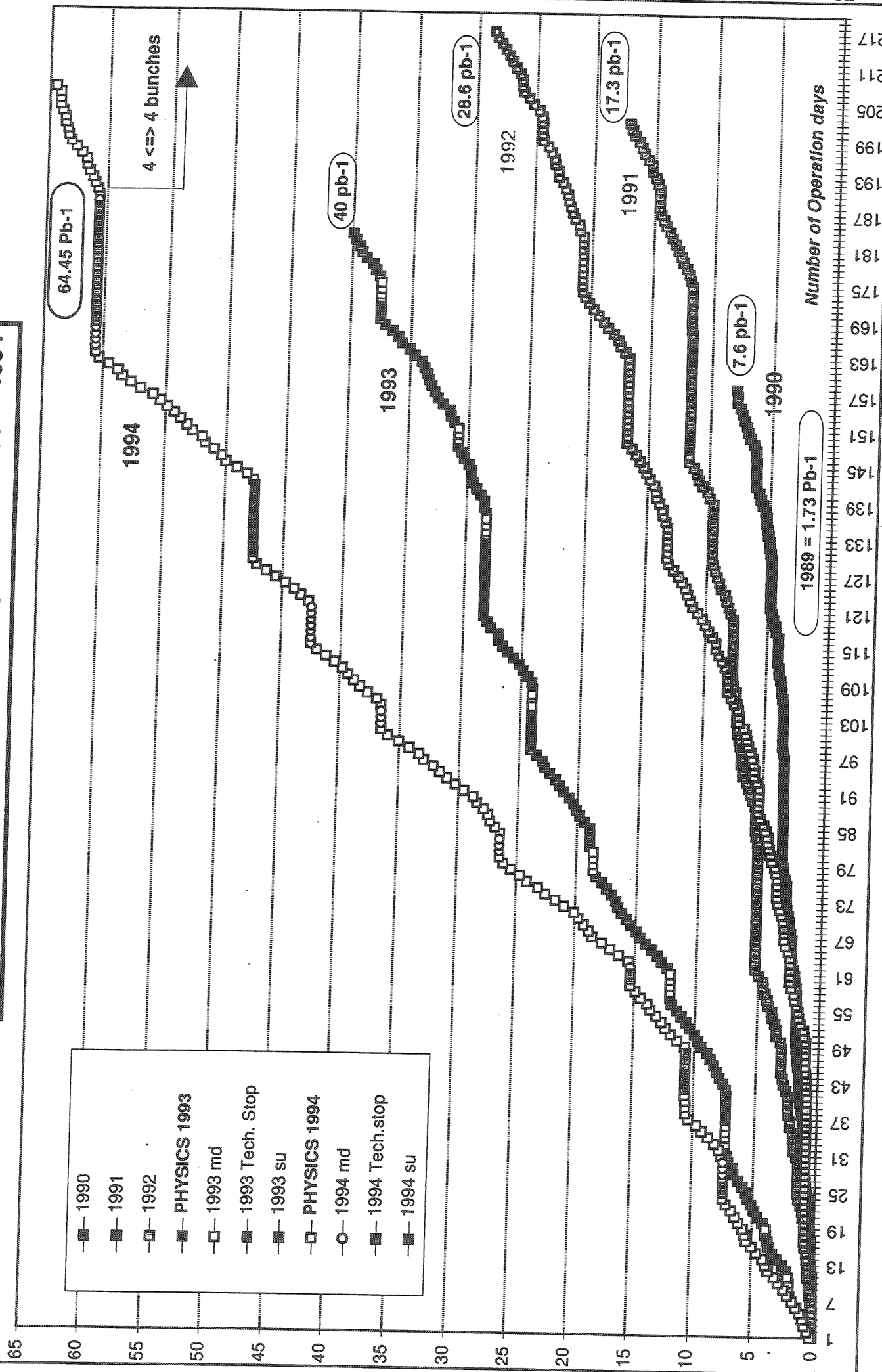






NA49 33 TeV  $^{208}\text{Pb}+^{208}\text{Pb}$

# Integrated Luminosities seen by Experiments 1990 -> 1994



## BUNCH TRAINS IN LEP

32

- Length of train limited by sensitive time window of the detectors to  $< 750$  ns.
- Bunch distance  $> 200$  ns because of minimum possible distance of separators from collision point.
- Maximum number of bunches per train: 4

1994: Successful tests with 1 train of 4 bunches per beam.  
Obtained luminosity:  $6 \times 10^{30} \text{ cm}^{-2} \text{ s}^{-1}$

1995: 4 trains of 4 bunches per beam.

Will increase the total number of bunches per beam from 8 (pretzel) to 16.

This will approximately double the luminosity.

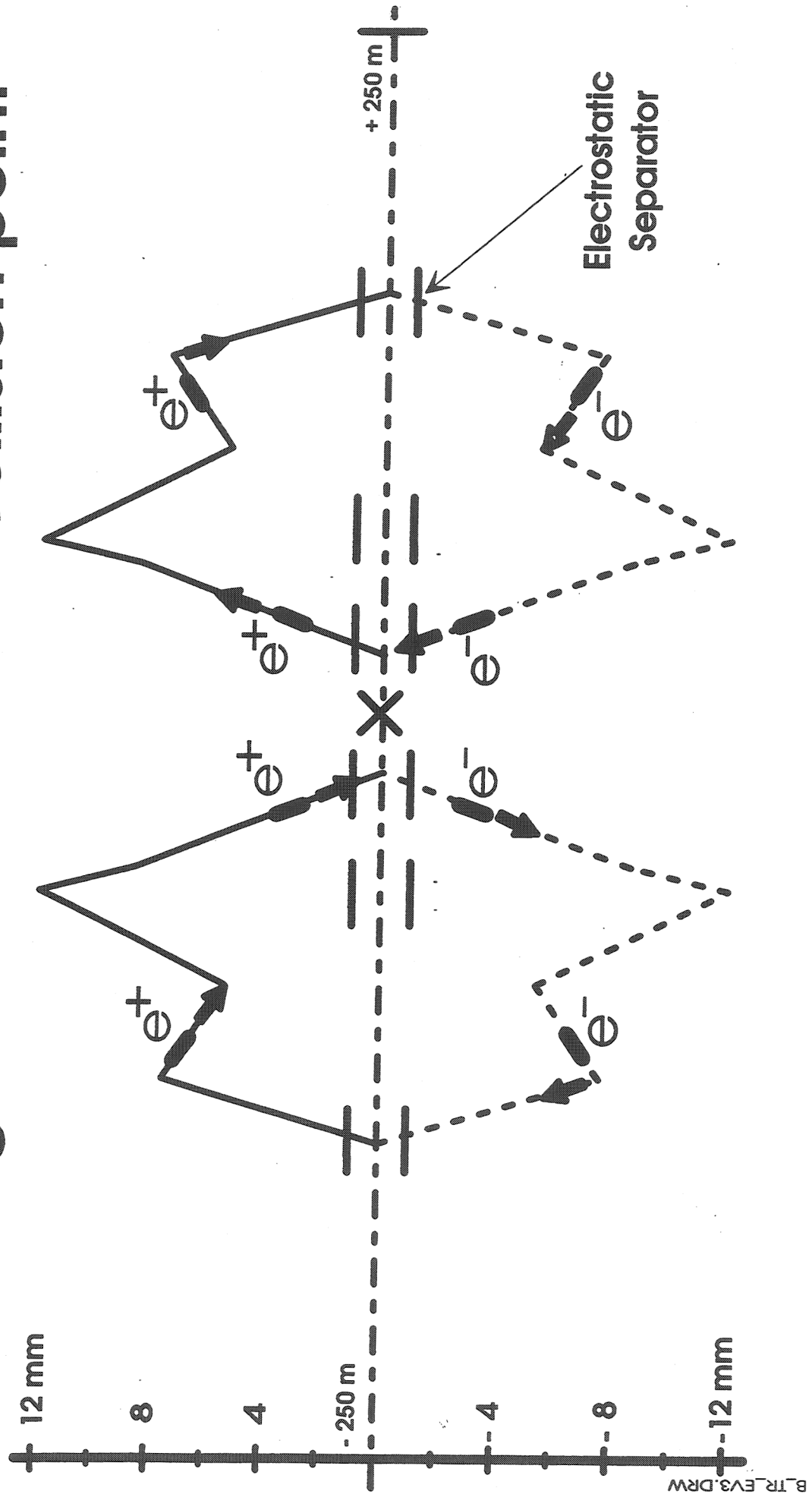
Together with a higher bunch current the expected luminosity is:

$$> 3.5 \times 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$$



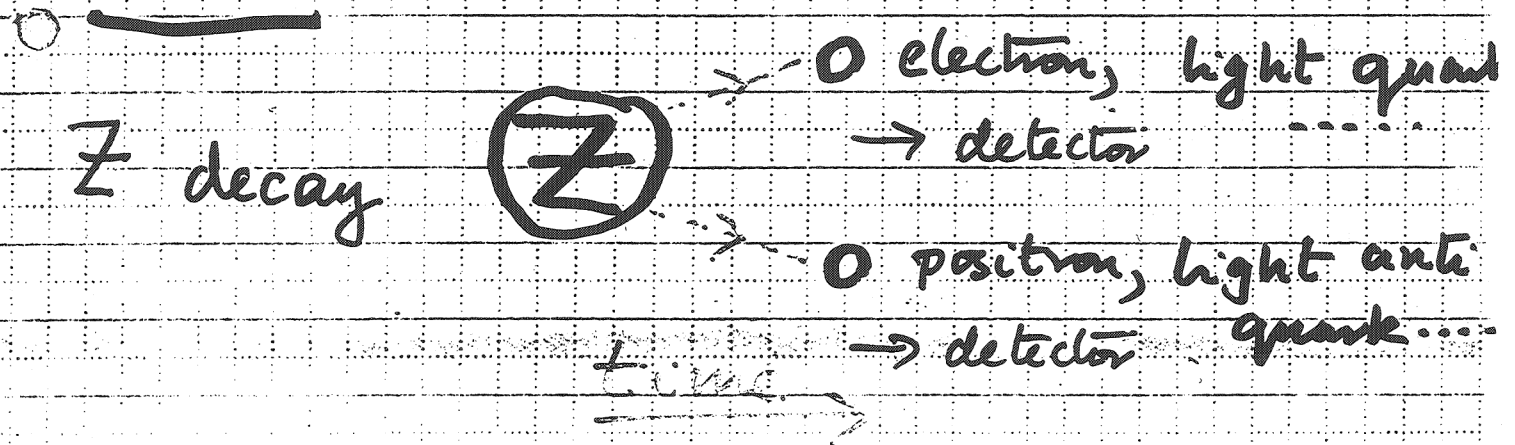
# Bunch Trains in LEP

## Configuration around a collision point

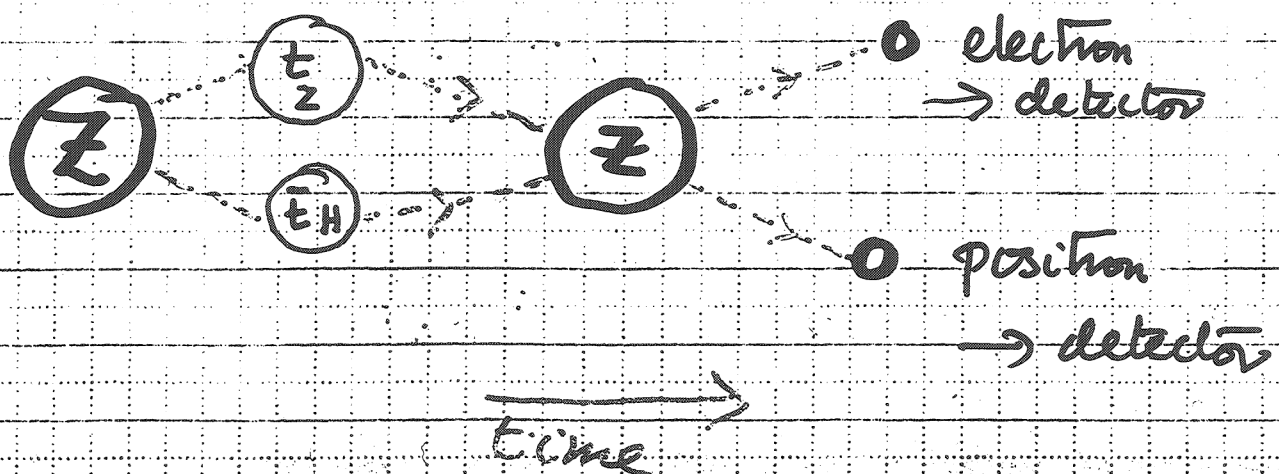


# High Precision Studies of Z Decays $\rightarrow$ Information on (hypothetical?) particles that are too heavy to produce at

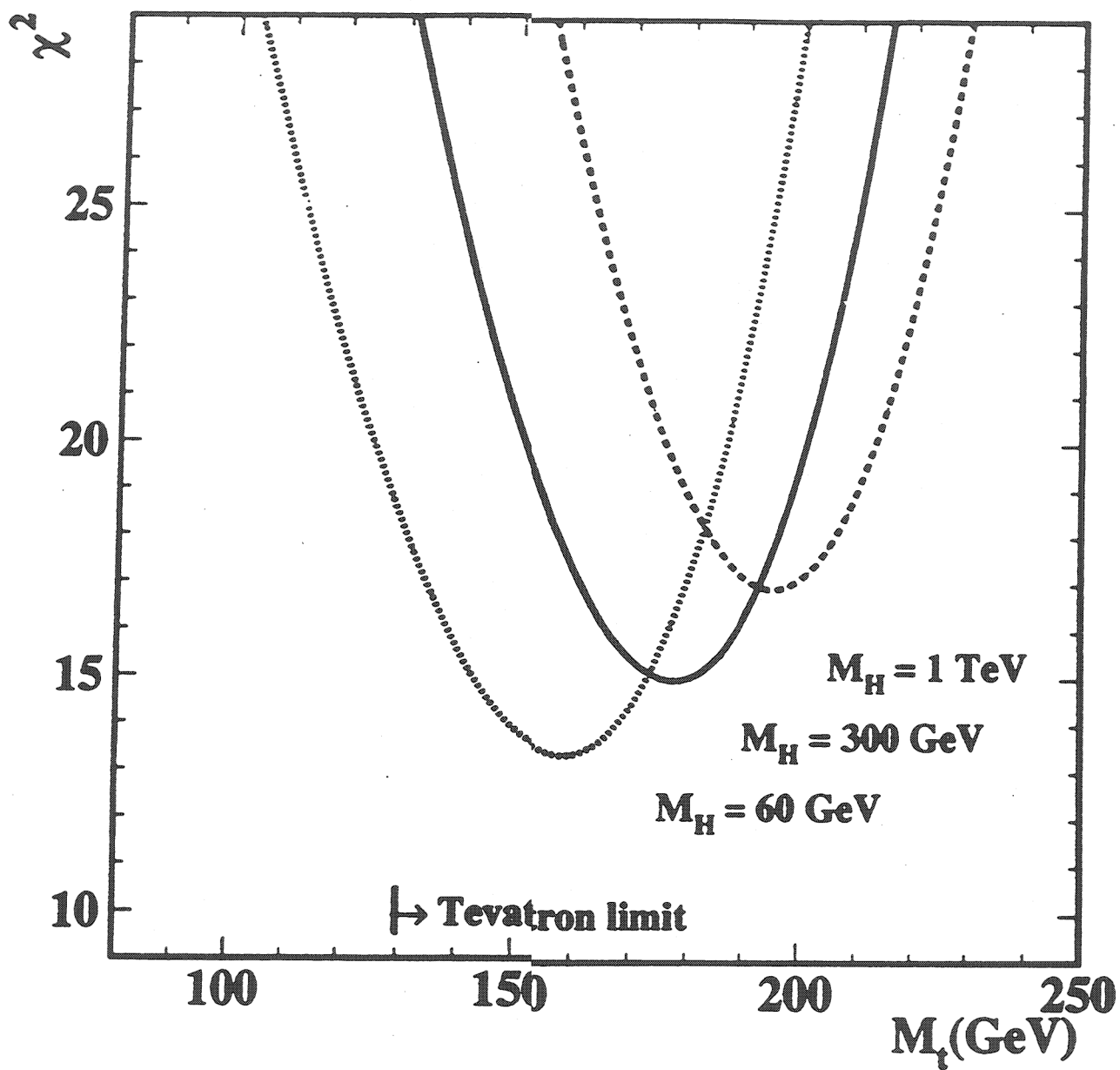
LEP

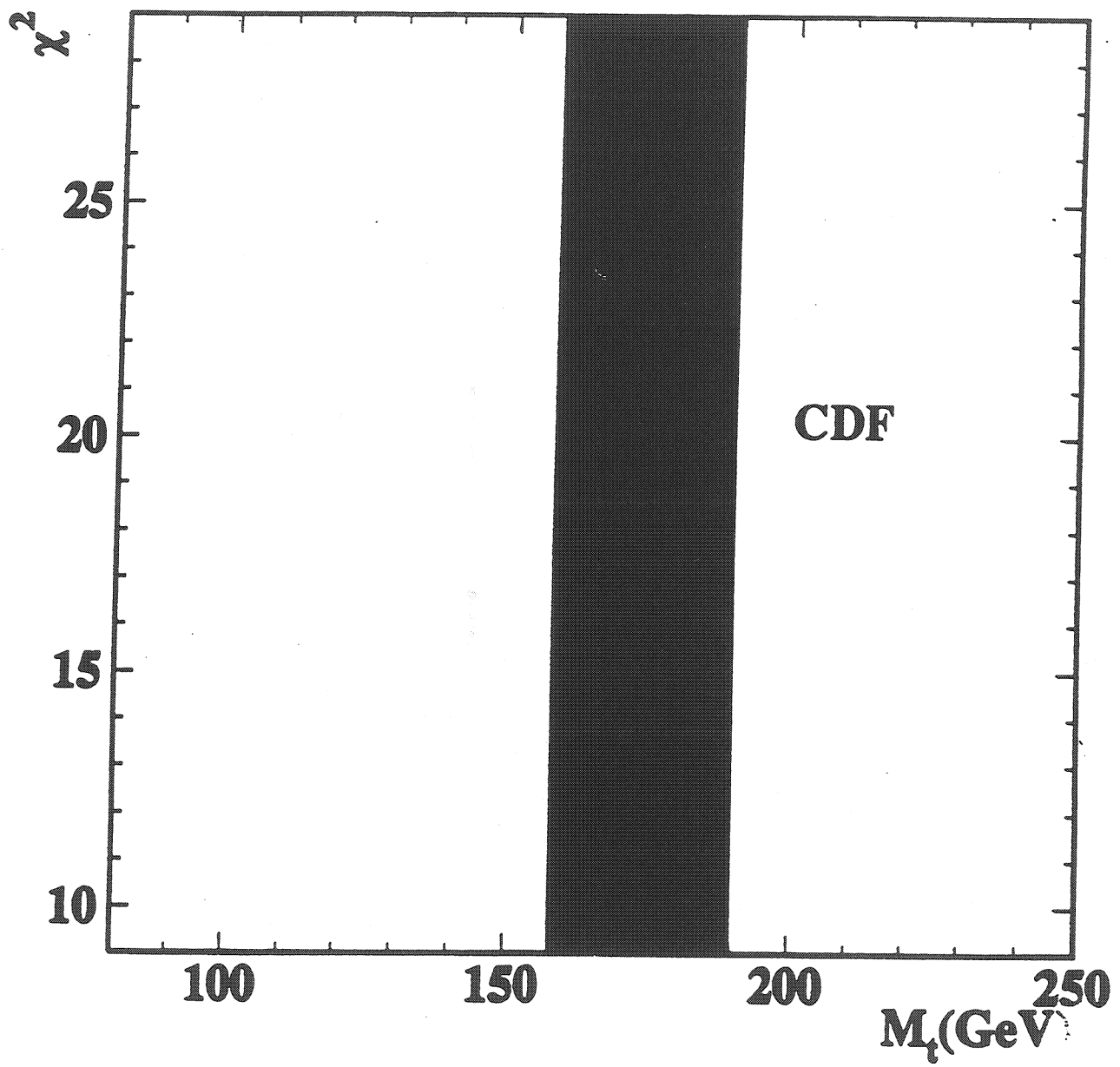


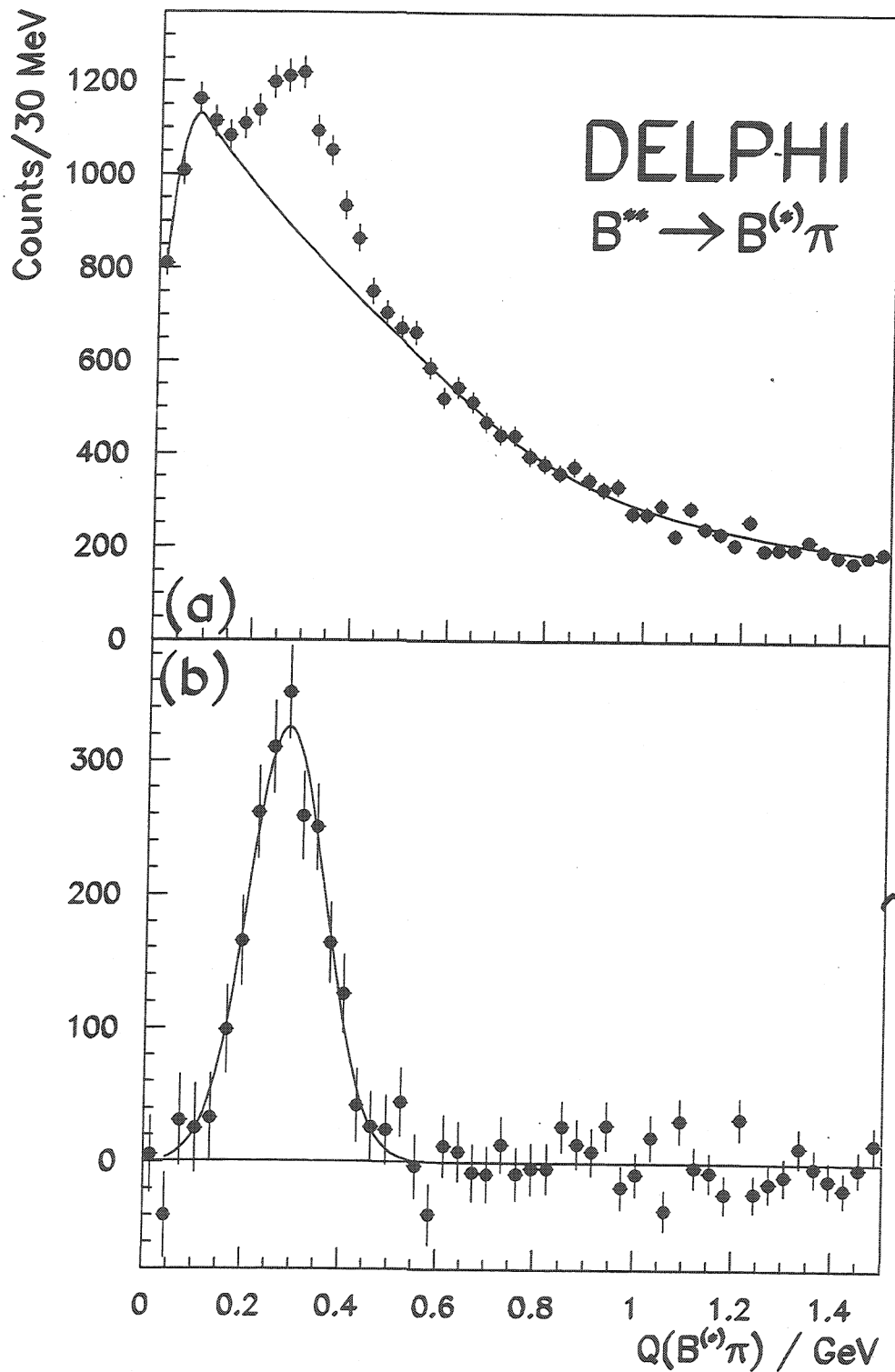
but the probability is slightly modified as energy may be "borrowed" for a short time  $\rightarrow$  "virtual" top quark, or  $Z + Higgs$ :



LEP + SLD + Colliders +  $\nu q$



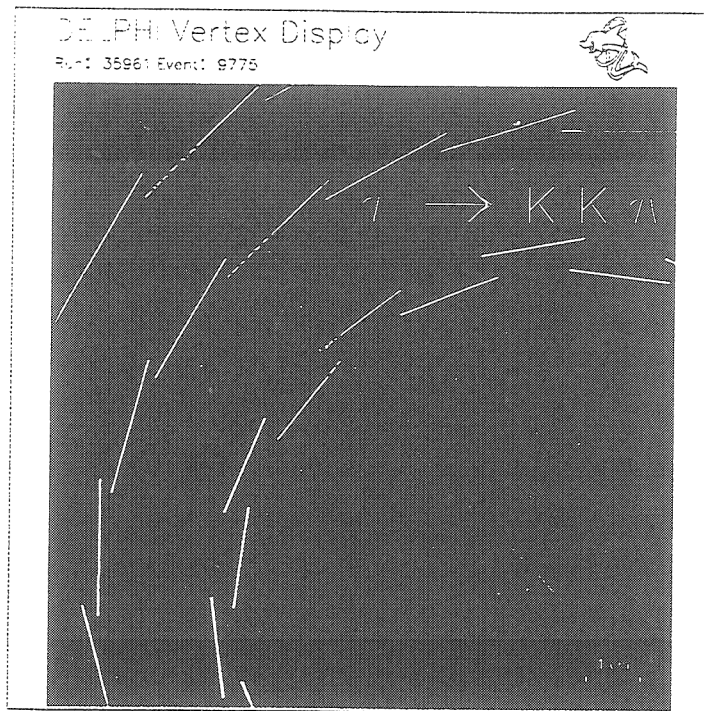




$\sim 1800$  cts  
 $\sigma = 79 \pm 5 \text{ MeV}$   
 $\sim 32\%$  of  $b$ 's

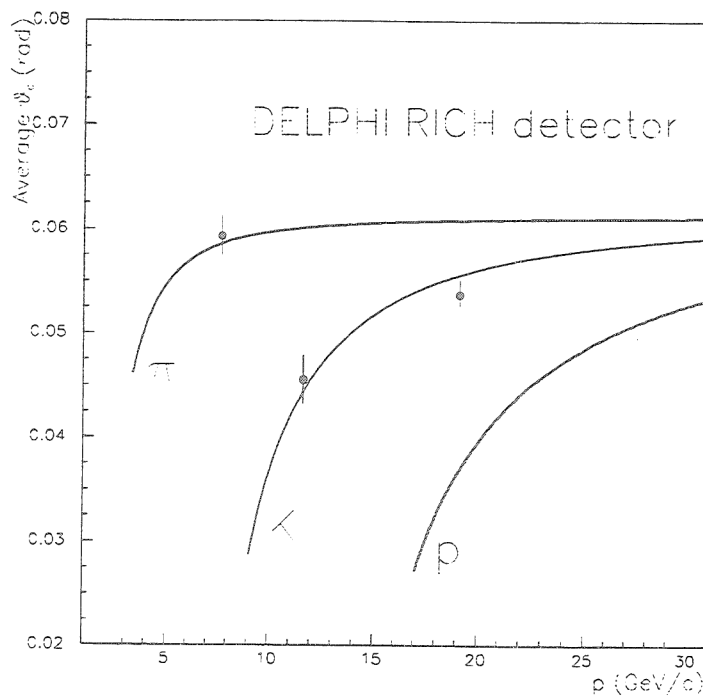
$$M(B^{**}) - M(B) = 469 \pm 5 \pm 20 \text{ MeV}$$

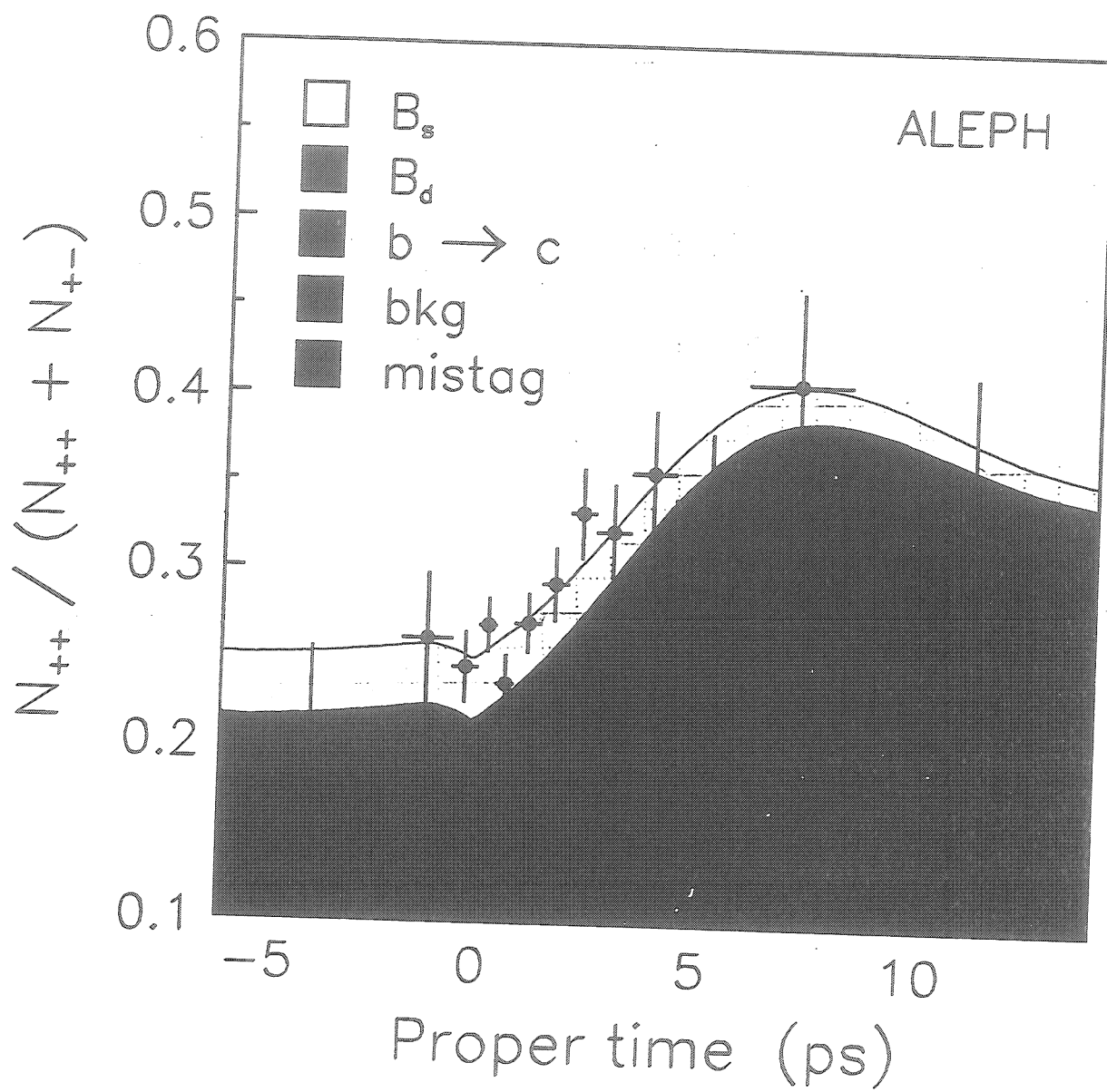
# RING IMAGING CHERENKOV Counters

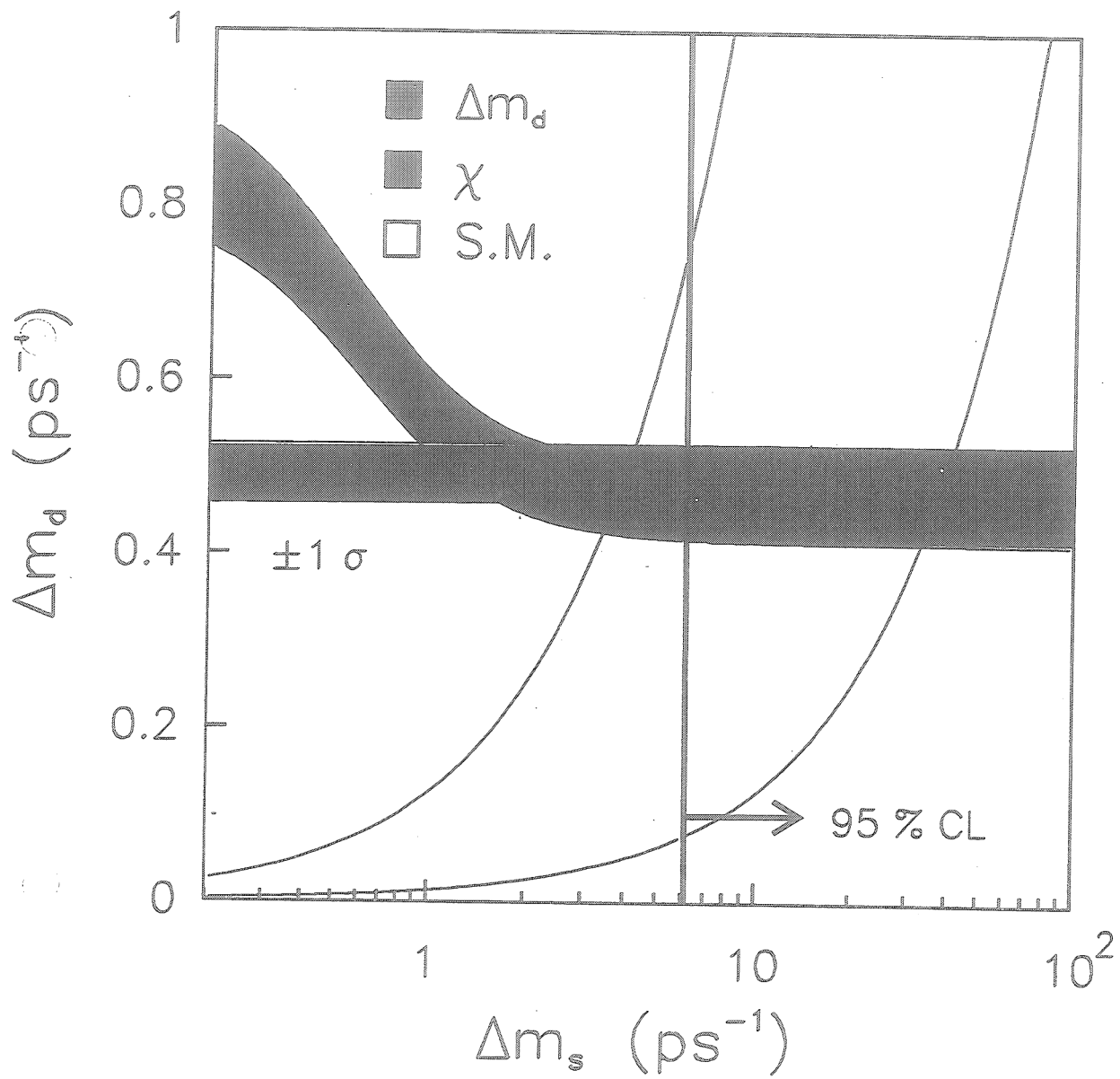


$$\tau^- \rightarrow K^+ K^- \pi^- \nu_\tau$$

UNAMBIGUOUS IDENTIFICATION!









## LEP Superconducting rf cavities

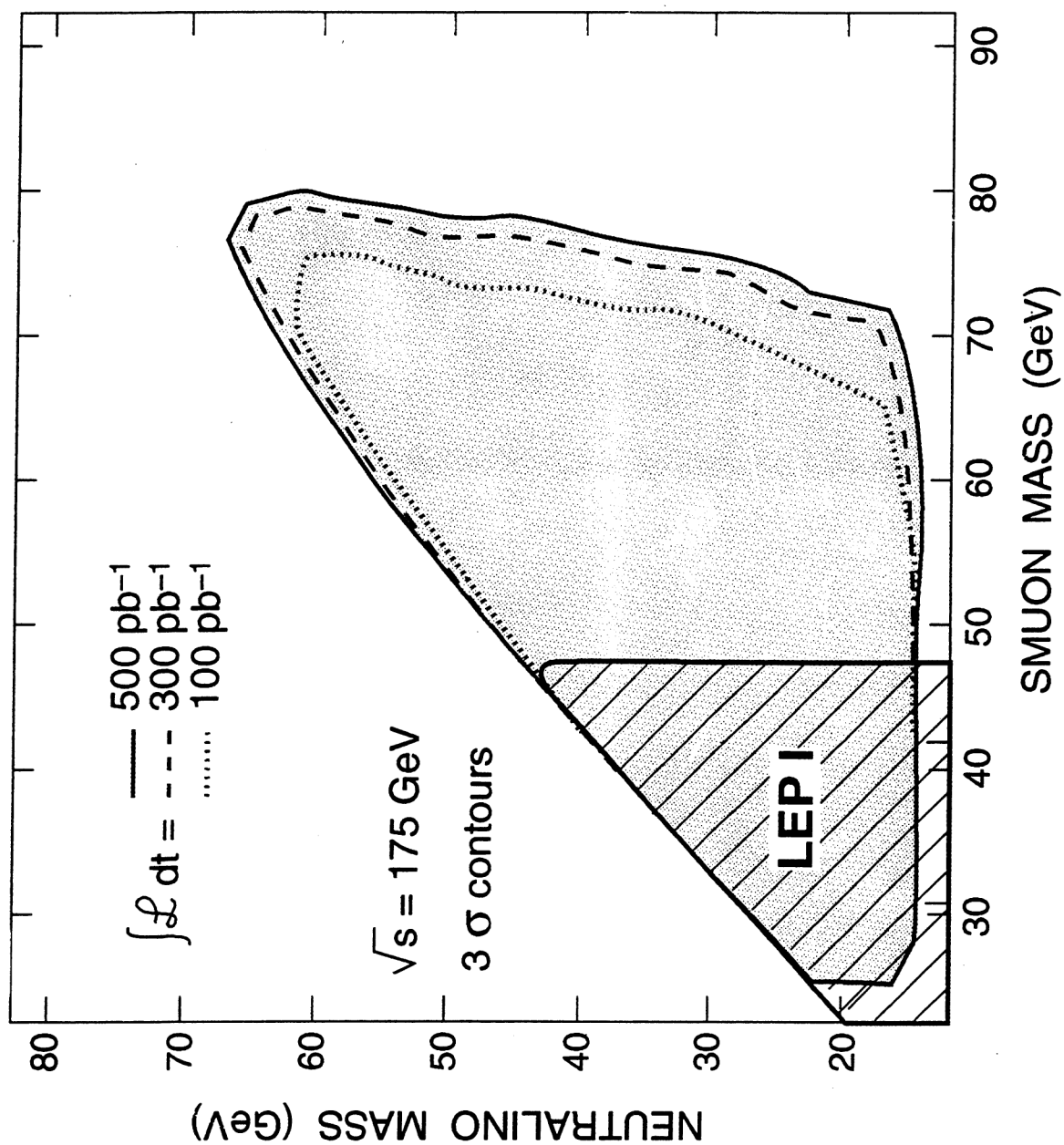
### Tests with beam of module 1002

- \* Consists of 4 cavities operating at 352 MHz
- \* Installed in October shutdown in LEP
- \* Equipped with improved main couplers
- \* Operational ! with nominal gradient of 6 MV / m providing 40 MV in total ; operated for 470 h at various field levels reliably and also during physics runs .

### Test of more advanced main couplers on superconducting test cavity

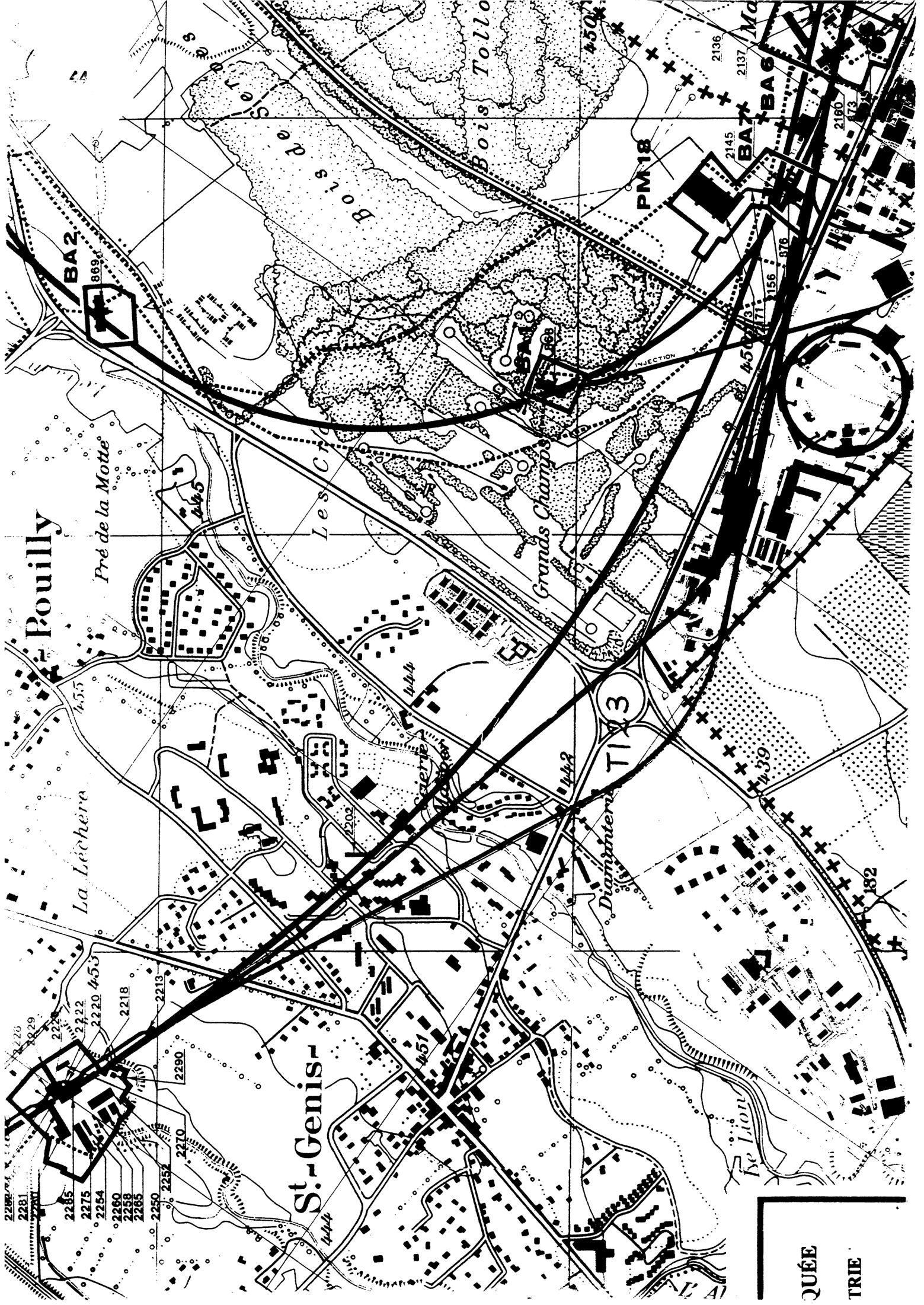
180 kW reached ( 150 kW LEP klystron limit )  
without multipactoring and degassing

## SEARCH FOR SUPERSYMMETRIC MUONS (smuons) AT LEP 200



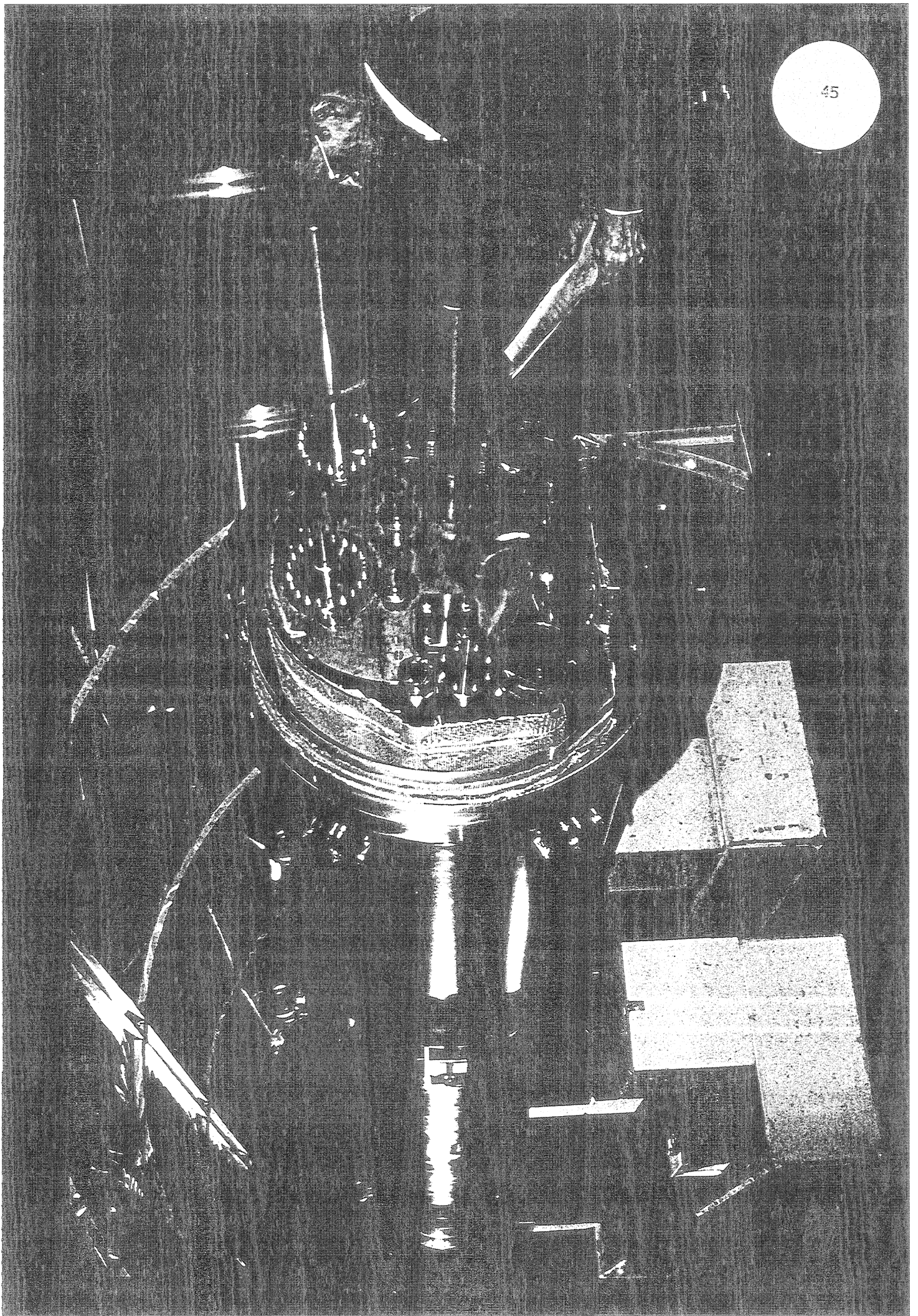
## Main parameters of LHC normal cell

Number of periods/octant		23.
Period length	(m)	106.48
Dipole length	(m)	14.2
Nominal energy	(TeV)	7
Field at nominal energy	(T)	8.36
Maximum energy	(TeV)	7.53
Field at maximum energy	(T)	9
Quadrupole length	(m)	3.0
Gradient at nominal energy (90°)	(T/m)	210
Tuning quadrupoles		none
Dipole/sextupole corrector length	(mm)	1070
Octupole/skew quadrupole length	(mm)	240
Dipole, QF, QD all separately powered		

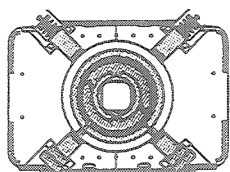


QUÉE  
TRIE

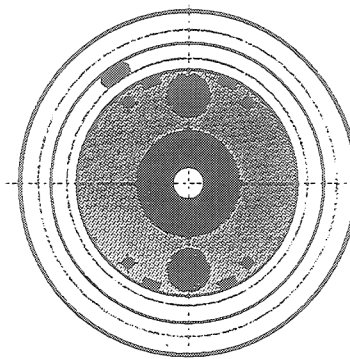




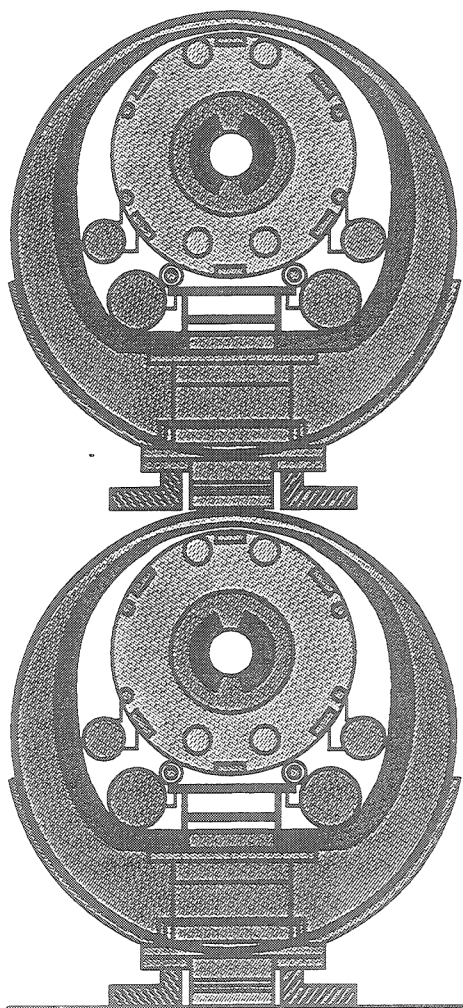
# DIPOLE MAGNETS



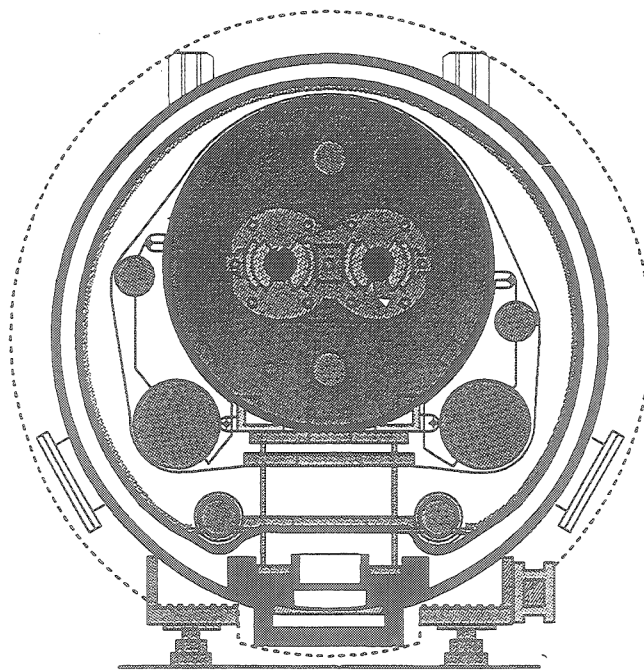
TEVATRON  
 $B = 4 \text{ T}$   
 Bore : 76 mm



HERA  
 $B = 4.5 - 6 \text{ T}$   
 BORE : 75 mm

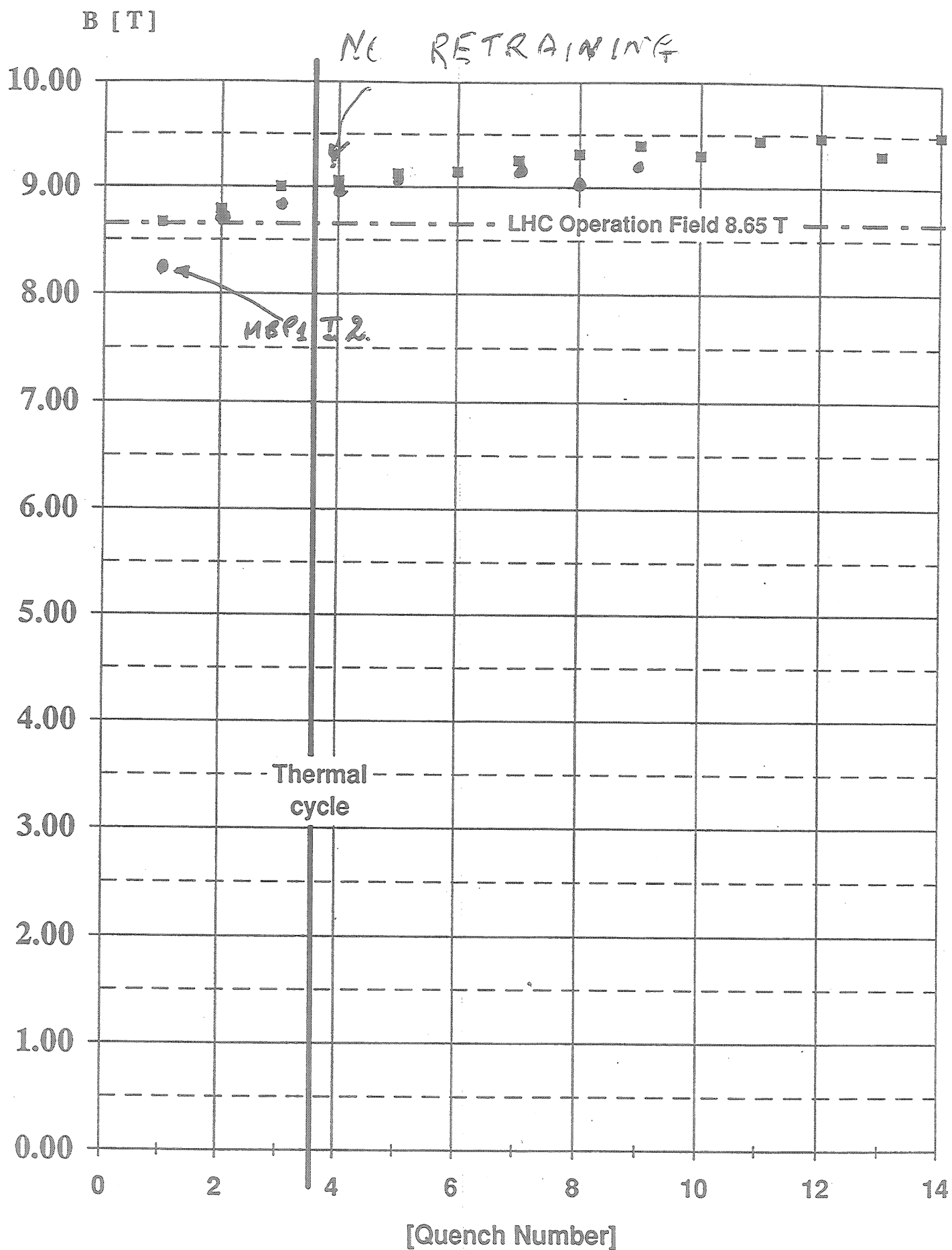


SSC  
 $B = 6.6 \text{ T}$   
 Bore : 50 mm



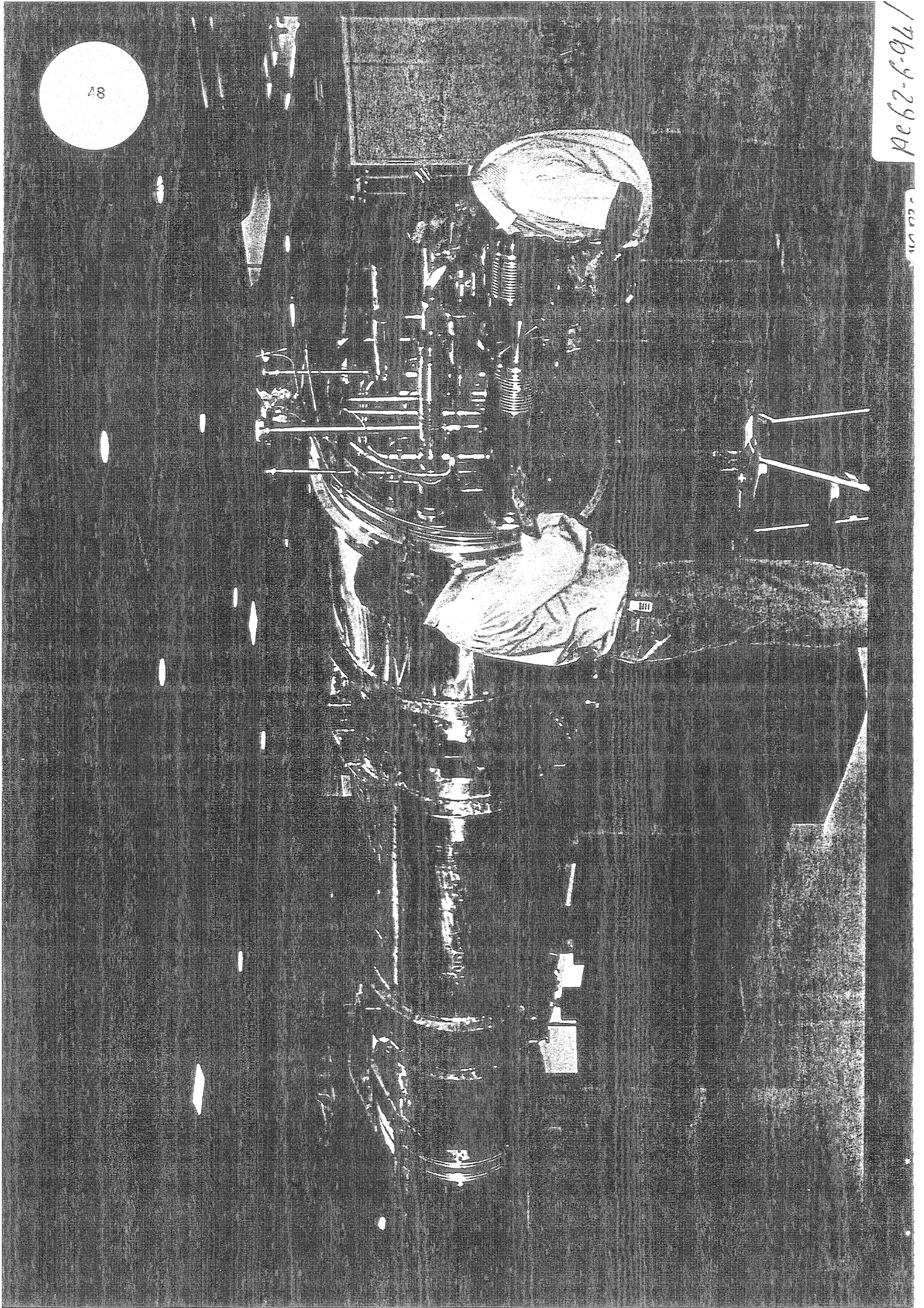
LHC  
 $B = 8.65 \text{ T}$   
 Bore : 56 mm



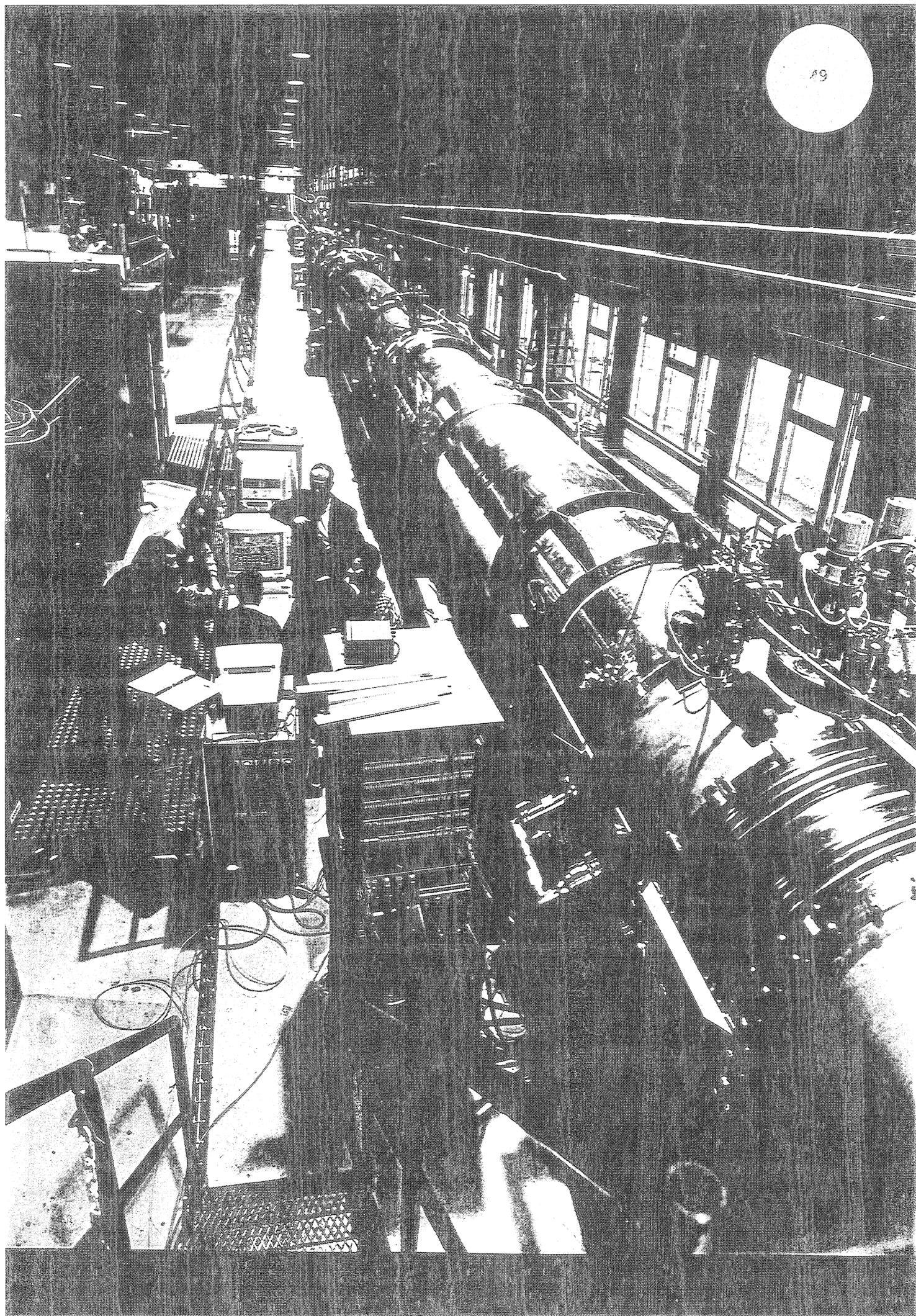


48

pe 62-6-941

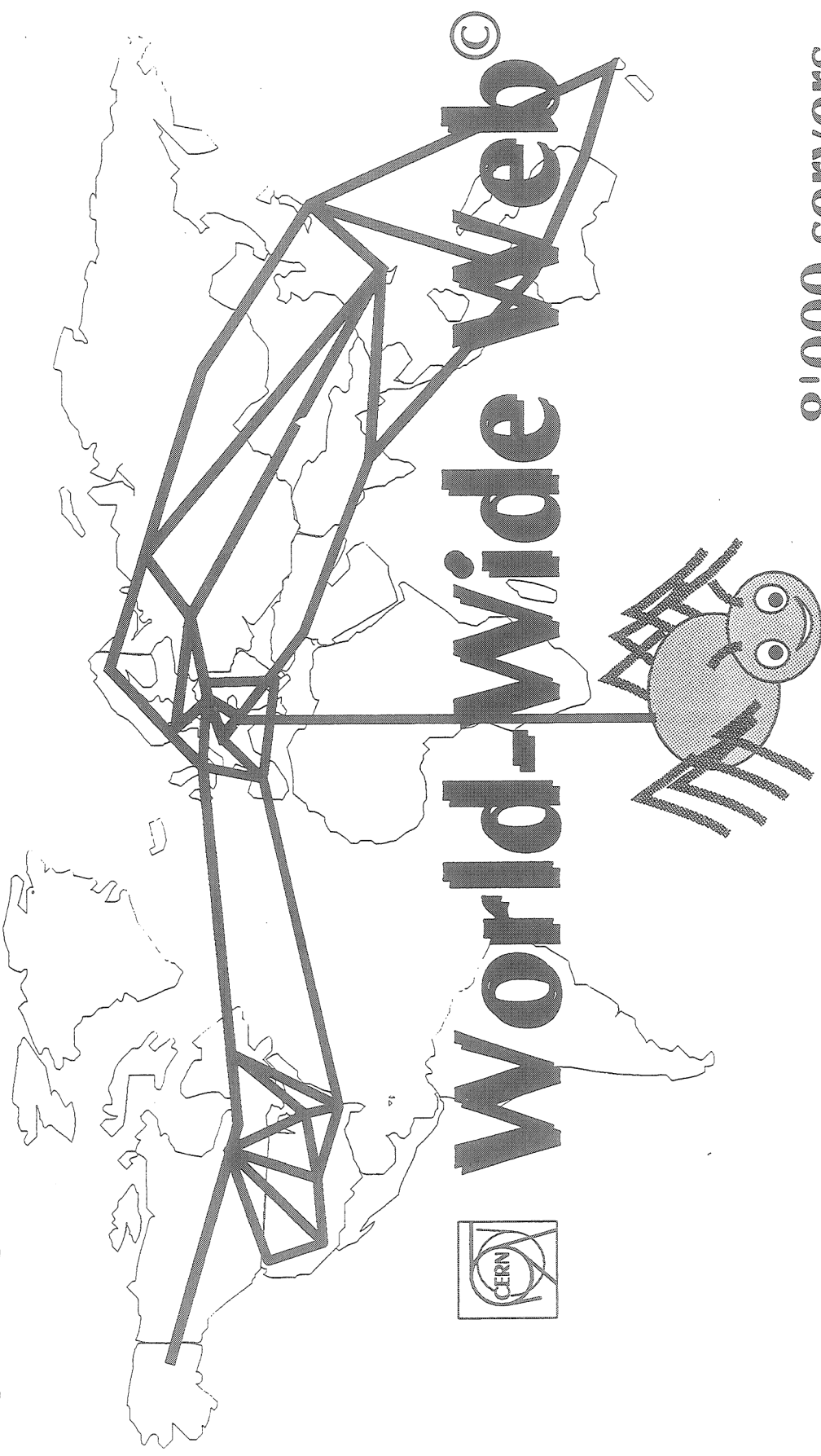






# From CERN to the World:

50



8'000 servers

>1'000'000 clients

>50'000'000 documents

1 interface

**The Global Internet  
Information System**

# Conclusion

51

CERN has enjoyed an excellent year

- operation / development of accelerators
  - physics
  - LHC approval
- ↳ many excellent years to come