



NP/30/mk

22 Mai 1967

CM-P00066149

M e m o r a n d u m

To : The members of the Nuclear Physics Research Committee
 From : J.M. Gaillard, J.C. Sens, V. Soergel, K. Winter, C. Rubbia
 Re : Separators for counterbeams after shutdown 1968

Recently, discussions have been opened on the lay-out of counter-beams after the shutdown 1968. A major factor in achieving significant improvements over the present situation is the availability of more separators for counter-beams than has been the case thus far. This note is concerned with a solution for this problem.

PRESENT STATUS

At present there are eleven electrostatic separators in use at CERN, while four more are under construction. Their length, kV/cm, present location and future destination are indicated below :

#	LENGTH (m)	kV/cm	PRESENT LOCATION	APPROVED COMMITMENTS
1	9	50	m ₄ Beam	Counter-beam
2	9	70 (GAP 11cm)	NPA Hall	None
3	9	50	East Hall	None
4	9	50	Stored in SB	None
5	9	50	Stored in SB	None
6	3	50	m ₆ Beam	m ₆ Beam
7	3	50	m ₆ Beam	m ₆ Beam

8	3	50	m_6 Beam	m_6 Beam
9	3	50	m_6 Beam	m_6 Beam
10	3 (ZADIG)	40	k_7 Beam	k_7 Beam
11	3 (ZADIG)	40	k_7 Beam	k_7 Beam
12	2m	50-100	Construction (ready Dec 1967)	k_8 Beam
13	2m	50-100	Construction (ready shutdown 1968)	$k_{11}(\nu)$ Beam
14	2m	50-100	Construction (ready shutdown 1968)	$k_{11}(\nu)$ Beam
15	(2) x 1m	50-100	Construction (ready shutdown 1968)	None

Separators # 2, 3, 4 and 5 are presently not in use and are being transformed, one by one, to a higher kV/cm level. They are, provisionally, reserved for the O_9 beam.

Separators # 6 and 7 are mounted in one tank to form effectively one 6m separator. The same holds for # 8 and 9.

Separators # 10 and 11 are non-standard separators. Since their performance is somewhat unsatisfactory, the present plan is to dismount them in the not too far future.

Separators # 12, 13, 14 and 15 are under construction in NPA. One has been committed to the k_8 beam, two more have been committed to the ν -beam (k_{11}), while the last one is provisionally reserved to replace the two 3m ZADIG separators in the k_7 beam.

As to the distribution of separators over bubble chamber work, versus counter work, of the presently existing eleven separators, one is in use for counter experiments, seven for bubble chamber experiments, while four are in storage and revision.

NEED OF SEPARATORS FOR COUNTER-BEAMS

The use of separators in Counter experiments dealing with K^{\pm} and \bar{p} , and to a lesser extent with $\bar{\pi}^+$ and p , (for $\bar{\pi}^-$ there is not need for separation) has two distinct effects :

1) For a given rate of wanted particles, the ratio wanted/unwanted particles is favourably influenced.

2) In experiments for which the overall time resolution of the apparatus is such that the maximum tolerable intensity (in view of accidental coincidences and/or number of beam tracks in spark chambers placed in the beam) remains below the maximum intensity of the beam, the total rate of wanted particles per burst is increased.

On both grounds, experiments can be done better or faster when separators are used in the beam. For 1) there is the alternative of electronic selection (e.g. by Cerenkov counters) of the wanted particles; for 2) there is no other option but the physical removal of the particles from the beam. As an example, the present π^- beam, which runs, with separator, at ~ 2 GeV/c, with a K^- rate of ~ 20.000 /burst and a $\bar{\pi}^-$ rate of ~ 400.000 /burst, would, for the same ceiling of 400.000 pions/burst, be limited to ~ 2000 kaons/burst, if no separator were used.

REQUEST

In view of the fact that a) the number of counter experiments using kaons/antiprotons is increasing and need higher precision to achieve results, b) that a 4 months period for installation work is forthcoming in 1968, c) that four

new separators are presently available for reallocation, we would like to request the allocation of two of the available 9m separators and two 2m separators to counter-beams. They could be placed in two beams derived from target #1 (two 9m separators) and two beams derived from target #8 (one 9 and two 2m separators).

This would imply the purchase of one 2m separator (two, if separator #15 were to replace the ZADIG separators in k_7). The cost of one 2m separator is ~120.000 Sw.Frs, to which must be added the cost of a power supply. The delivery time is of the order of one year.

Copies to : EEC
G. Petrucci
C. Germain