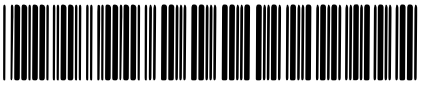
K. Hübner

ISR-OP/DN/vd



23 September, 1971

ISR RUNNING-IN

Data on Colliding beams runs 76 to 110

Data on runs 54-72 were discussed in Notes dated June 3 and June 22.

During the Summer period the manpower situation did not permit to evaluate the data on machine behaviour during the various colliding beam runs, in sufficient detail.

The fact that the data, in particular data on background (spike periods), and the recordings in the logbook are not always complete, makes it difficult to correlate observed effects in an easy way.

Therefore, we present only a summary of the main data for these runs in the enclosed table. We also add graphs (made by Mme Donat) showing the variation in decay rate for a number of runs. We will not draw any conclusions at the present time.

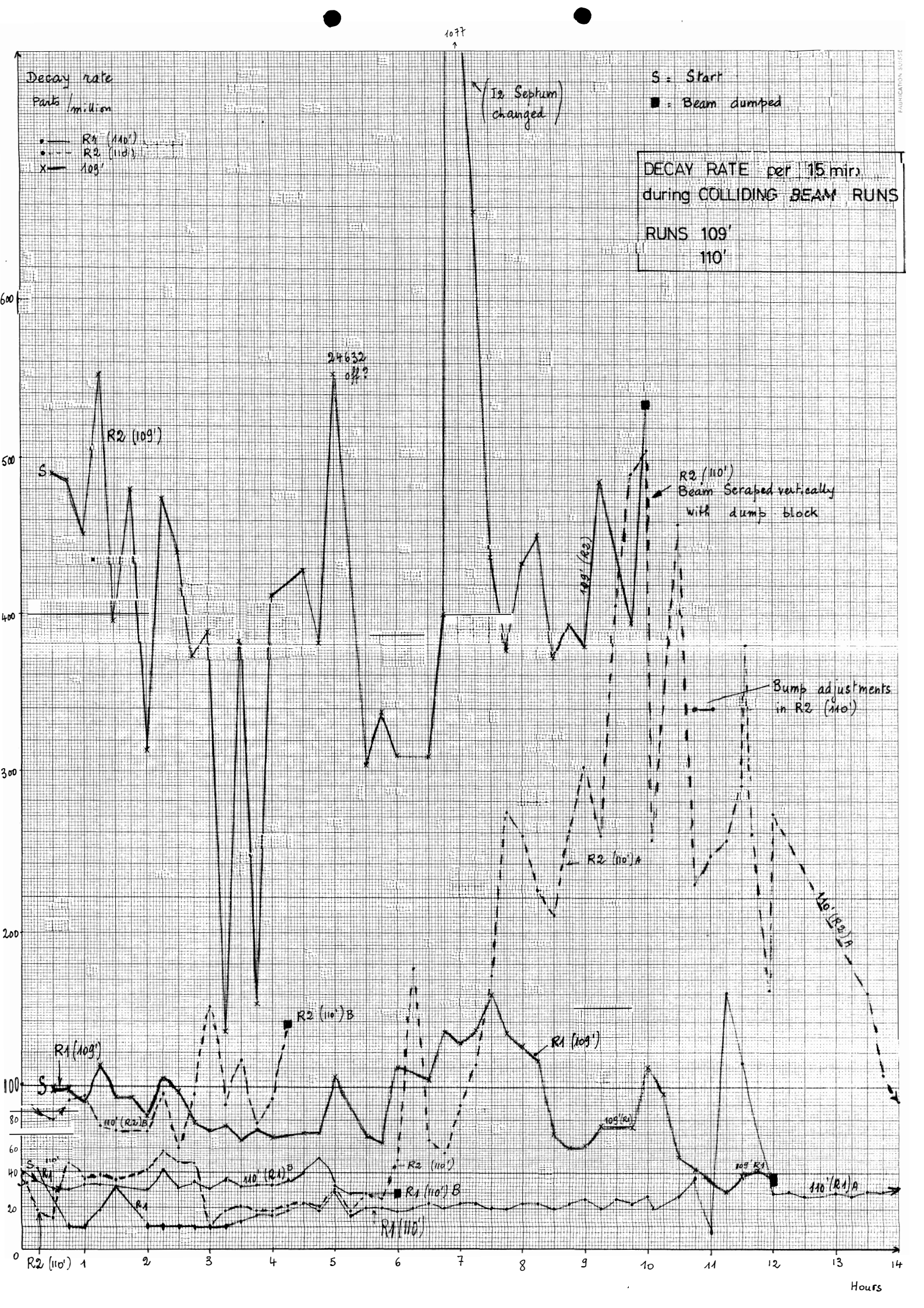
D. Neet

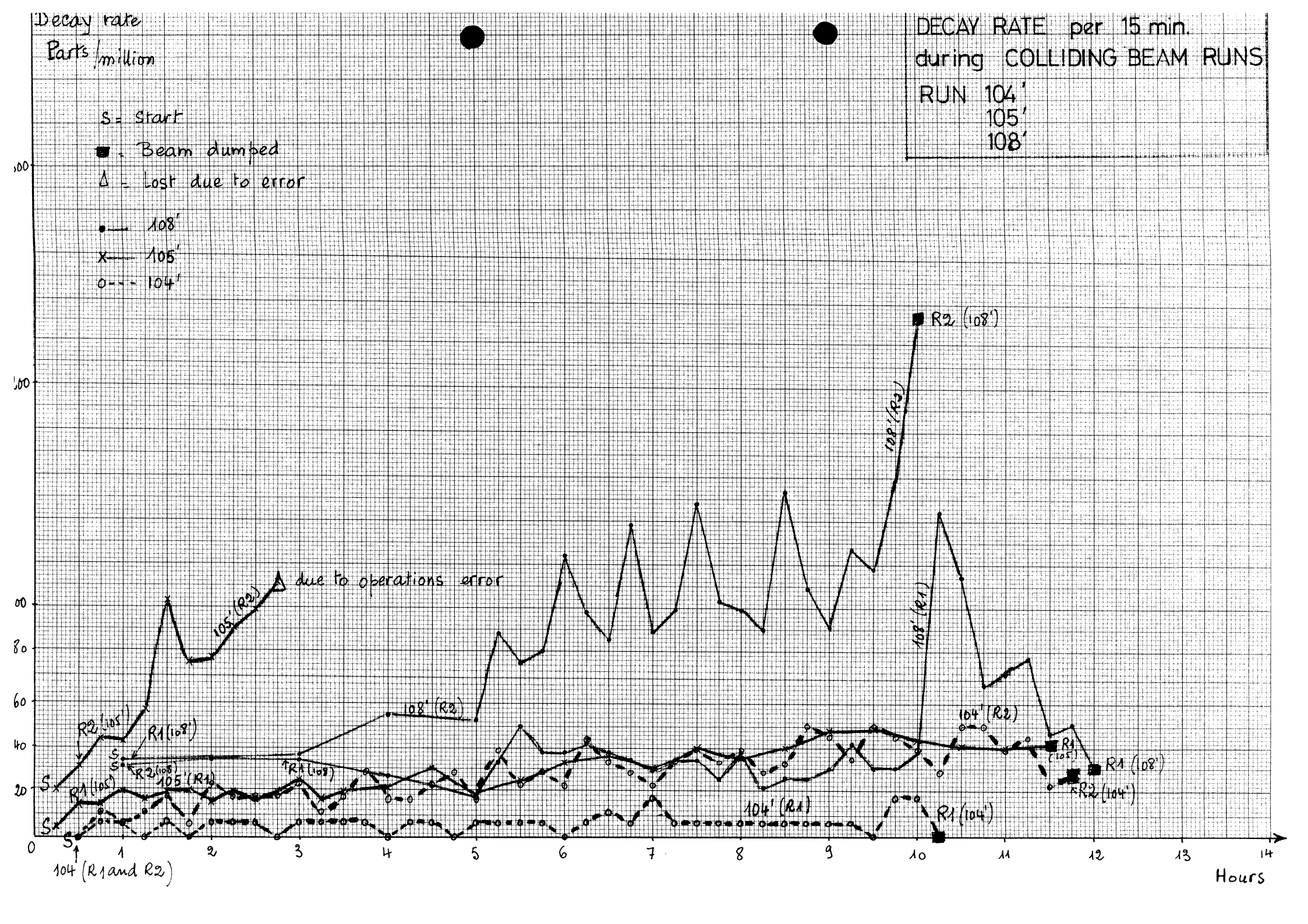
Distribution :

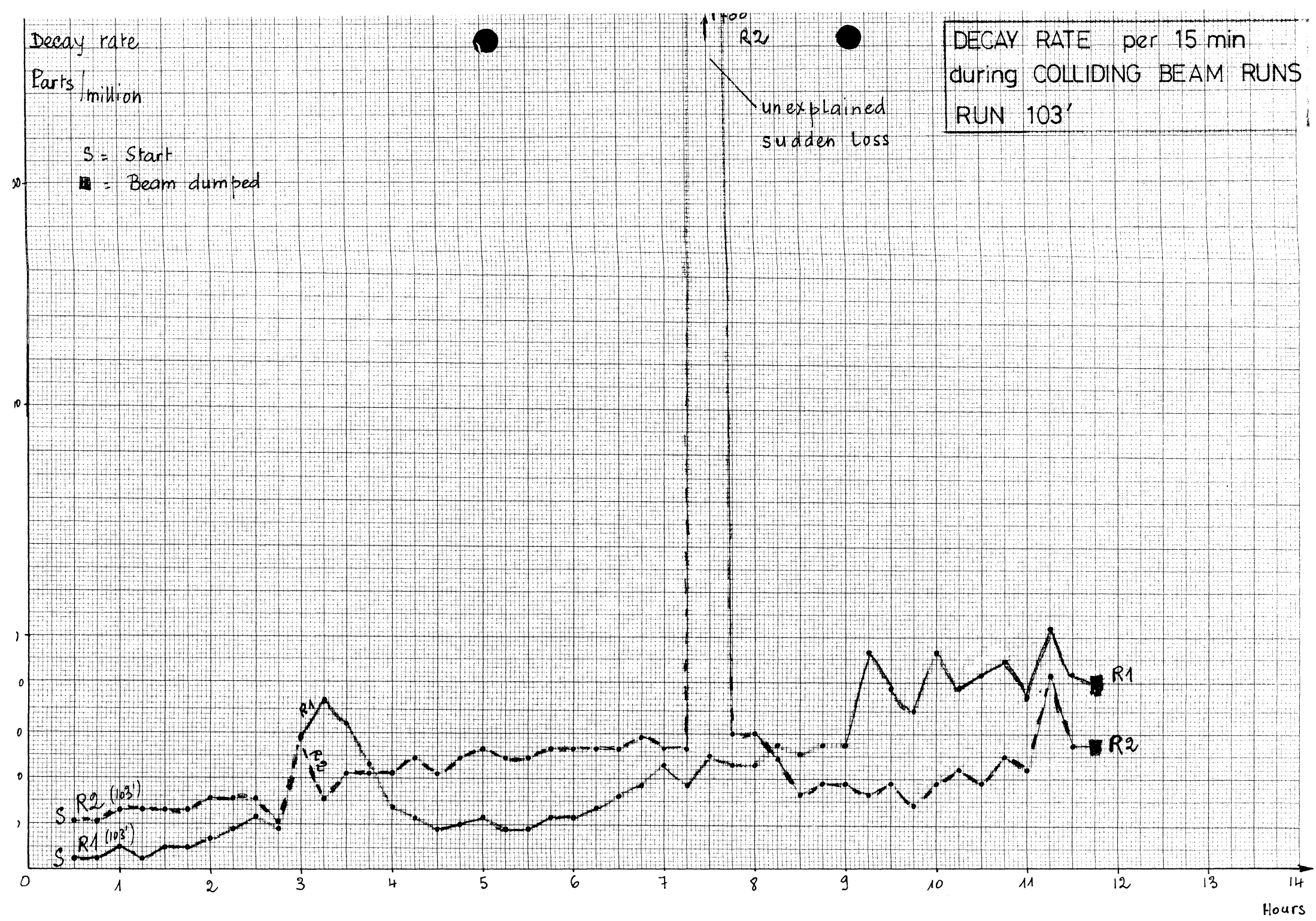
Prof. K. Johnsen
Group Leaders
Running-in Committee
Engineers-in-Charge
Operators
E. Brouzet MPS
M. Höfert HP
K. Potter NP

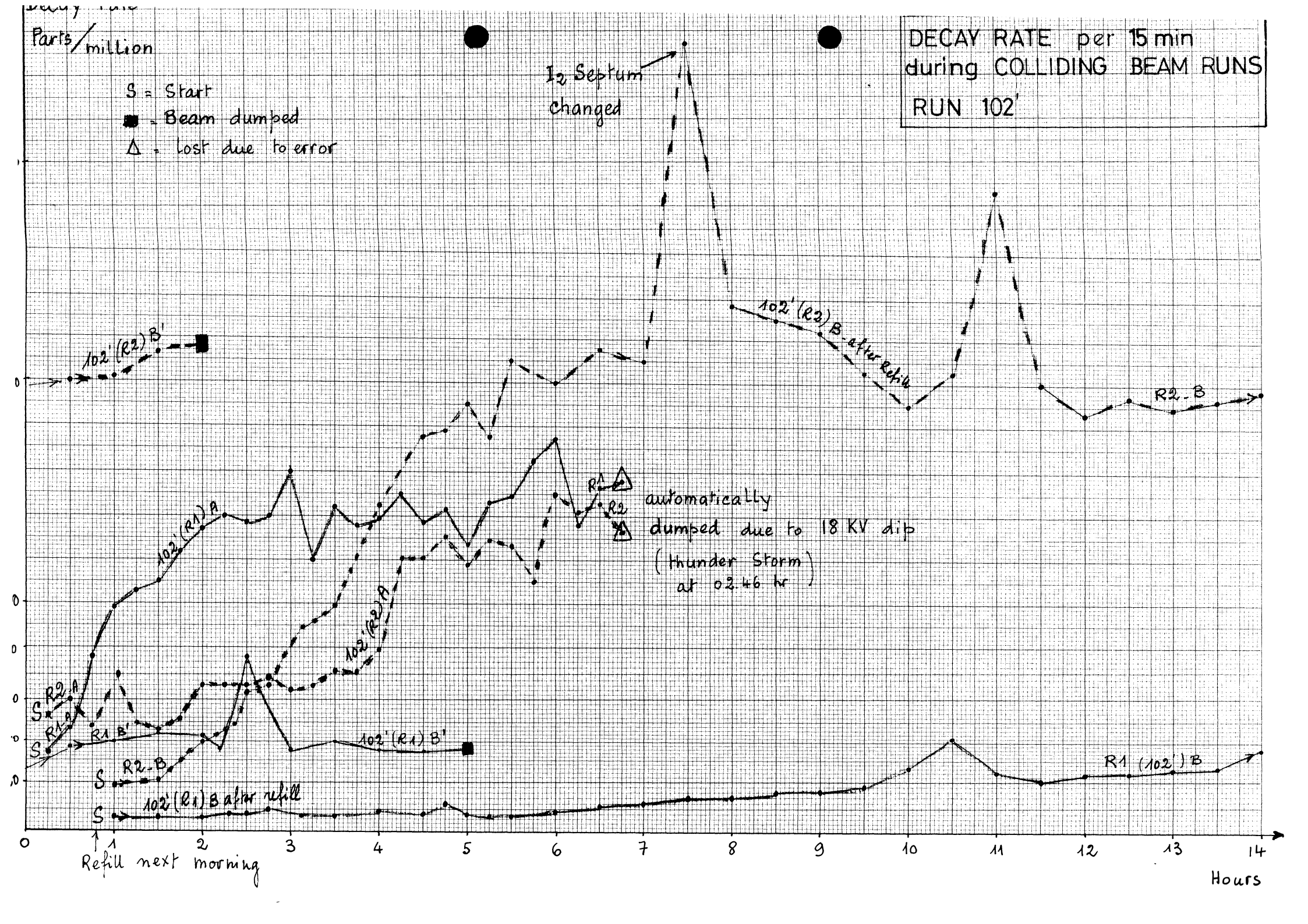
		nbr	WORKLINES		initial current		RING 1 decay pp 10^{-6}		Beam size (probe)		growth during run		RING 2 decay pp 10^{-6}		Beam size (probe)		growth during run		
m	GEV	bunches	R1	R2	i_1	i_2	lowest	typical	H	V	H	V	lowest	typical	H	V	H	V	Comments
'6	15	20	FS15	FS15	2.2	2.2		30						80					Lost Beam I; cooling wa
'8	15	4	FS15^{+CO}	FS15^{+CO}	.9	1		20						70					–
'4	22	20	22FA	22FA	2.2	1.7	13	50	92	40.1	–	1.1	13	20	64	29	31	11.9	11 hr
'7	15	20	FS15^{CO}	FS15^{CO}	3.	2.3		200	81.4	31.6				200	76.5	27.5			–
'8	22	4	22FA	22FA	1.3	1.1		10	–	35.1				20		29			mystery losses.
'9	15	20	← 84K4	=FS15 →	2.4	2	45	100	72.6	28.5	10.5	8.4.	7	30	70.2	23.7	14.1	9.5	
2	10	4(20)	10CL	10CL	.9	1.1	20	300	92	24			100	200					
3	22	20	22FA	~	3.2	2.4	150	300	71	32	34	-3.7?	17	200	47	35	13	6.3	
4	26	20	26FA	~	2.5	2.5	40	100	72	35.3	19.1 [12hr]	5	21	100	75.4	30.3	21.6 [12hr]	1	long run 34 hrs.
								250			+13.4 [21hr]	0		200			+14.9 [21hr]	.3	growth ~~after~~ between 0–12, 12–21, and 21–32 hours
~~5~~	~~26~~	~~20~~	~~21FA~~	~~~~	~~2.8~~	~~2.5~~	~~1~~	200			+0.3 [32hr]	0.4		300			-5.3 [32hr]	1	
5	26	20	26FA	~	2.8	2.5	12	40	72.7	38	27.5	3.1	5	15	72.8	35.6	14.9	5.8	
6	15	4	15FA -2% TO1	15FA +3% TO2	1.1	1.	10		85.2	33.5			13		79.6	31.1			Ring 2 lost; storm ick
'7	22	20	22FA	~	3.9	3.2	75	160	87.6	~~41.4~~ 40.7	10.7	1.5	440	600	70.6	39.9	11.3	3.	stacked in parts!
'0	10.5	4	10CL		-2	.88	10						17						
'1	15	20	15FA		2.5	2.3	43	120	110?	34.7			70	300	78	34.9			
'2	22	20	22FA		2.7	2.7	34	140					46	100				long run	Both beams lost; storm ick
					2.5	2.5	6.5	20					21	200					New stacks

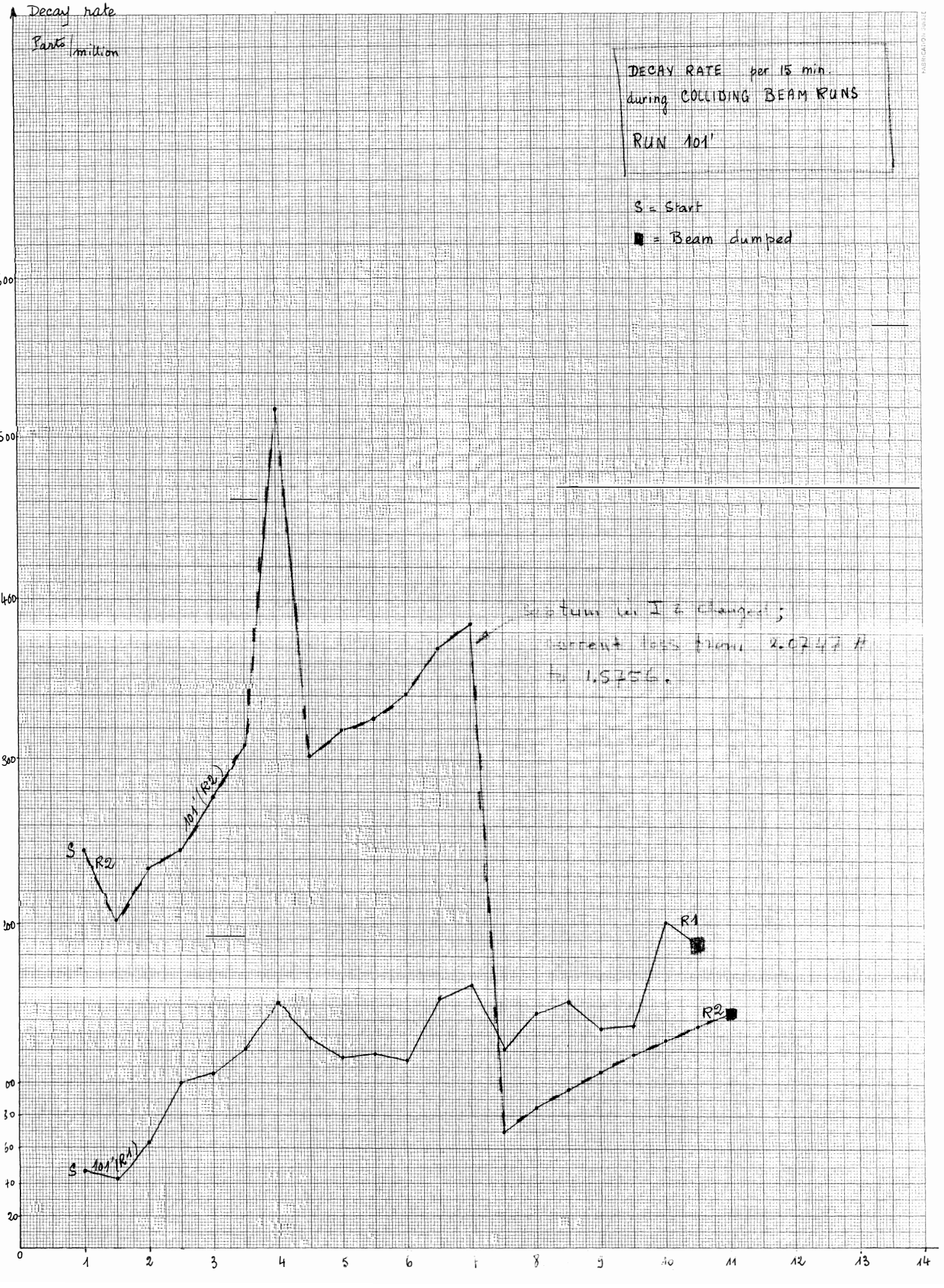
		nbr	WORKLINES		initial current		RING 1 decay bb 10^6		Beam size (probe)		growth during fill		RING 2 decay bb. 10^6		Beam size (probe)		growth during fill		
in	GeV	bunches	R1	R2	i_1	i_2	lowest	typical	H	V	H	V	lowest	typical	H	V	H	V	Comments
03	10	20	10FH + 00	→	1.46	1.27	5	40	74.8	49.5	8.5	10	21	50	83.1	29.8	11.6	10.9	
04	22	4	22FA	~	1.15	1.33	7	10	69.6	22.3	10.2	12	6	30	76.1	36.1	18.3	1.5	
05	15	20	15FA	C015	2.5	2.6	14	30					20	760					
08	22	4	22FB		1.6	1.5	21	30	67.9	31.8	2	-1.7?	57	100	79.1	32.5	1.4	7.1	
09	22	20	22FA	~	2.7	2.8	31	100					183	400					Beam 2 lost; no explan.
10	26	20	26 FH		2.6	2.5	10	20 ↓ 40					15	40 ↓ 250					Beam 2 scraped. Will dump to improve background

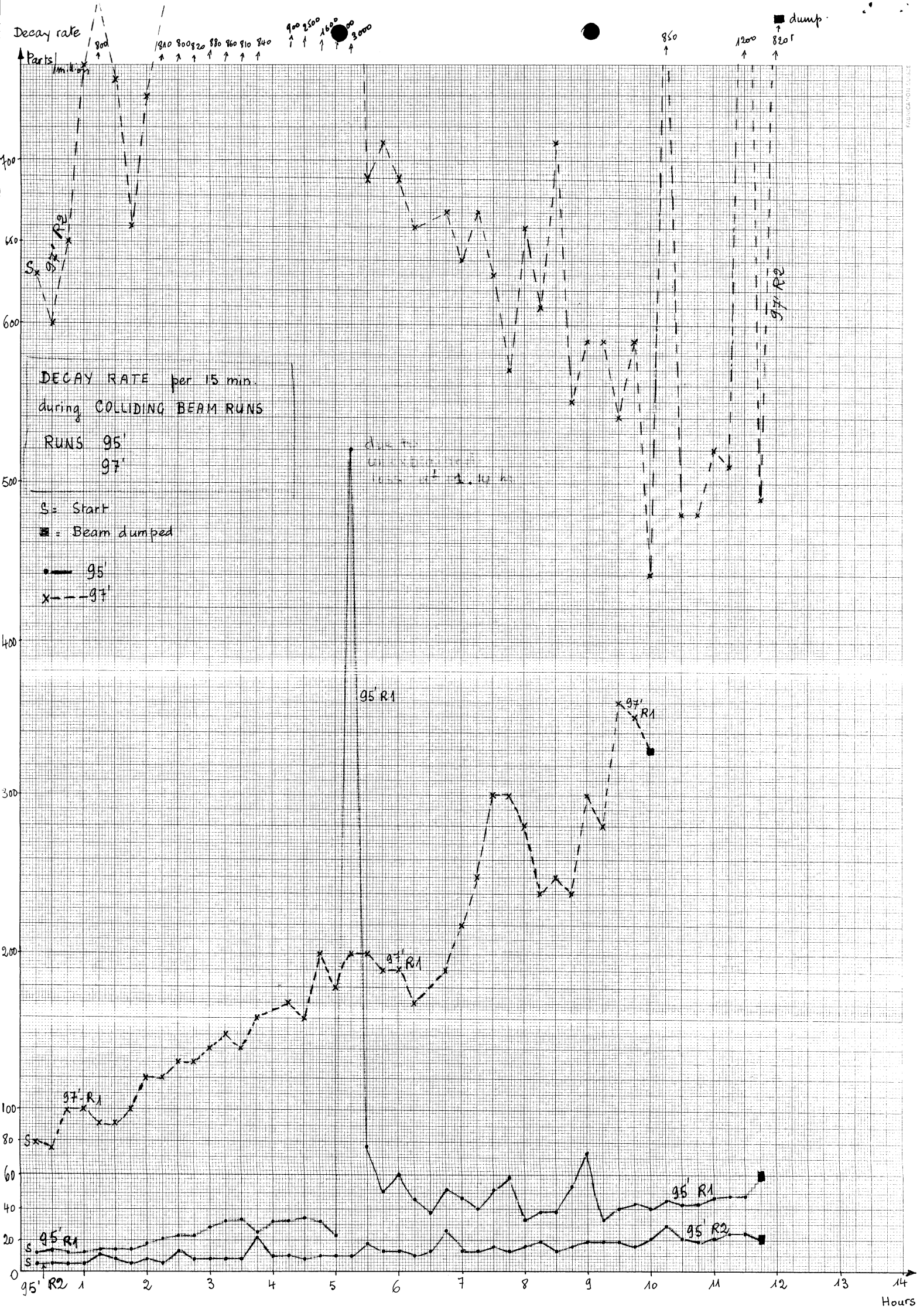

Decay rate
Parts / million
R1 (110')
R2 (110')
109'
1077
(I2 Septum changed)
S = Start
■ = Beam dumped
DECAY RATE per 15 min.
during COLLIDING BEAM RUNS
RUNS 109'
110'
600
500
400
300
200
100
80
60
40
20
0
24632
off?
S
R2 (109')
R2 (110') Beam Scraped vertically with dump block
109' (R2)
Bump adjustments in R2 (110')
R2 (110')A
110' (R2)A
R2 (110')B
R1 (109')
S
110' (R2)B
109' (R1)
S 110'
R1
110' (R1)B
R2 (110')
R1 (110')B
R1 (110')
109' R1
110' (R1)A
R2 (110') 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Hours

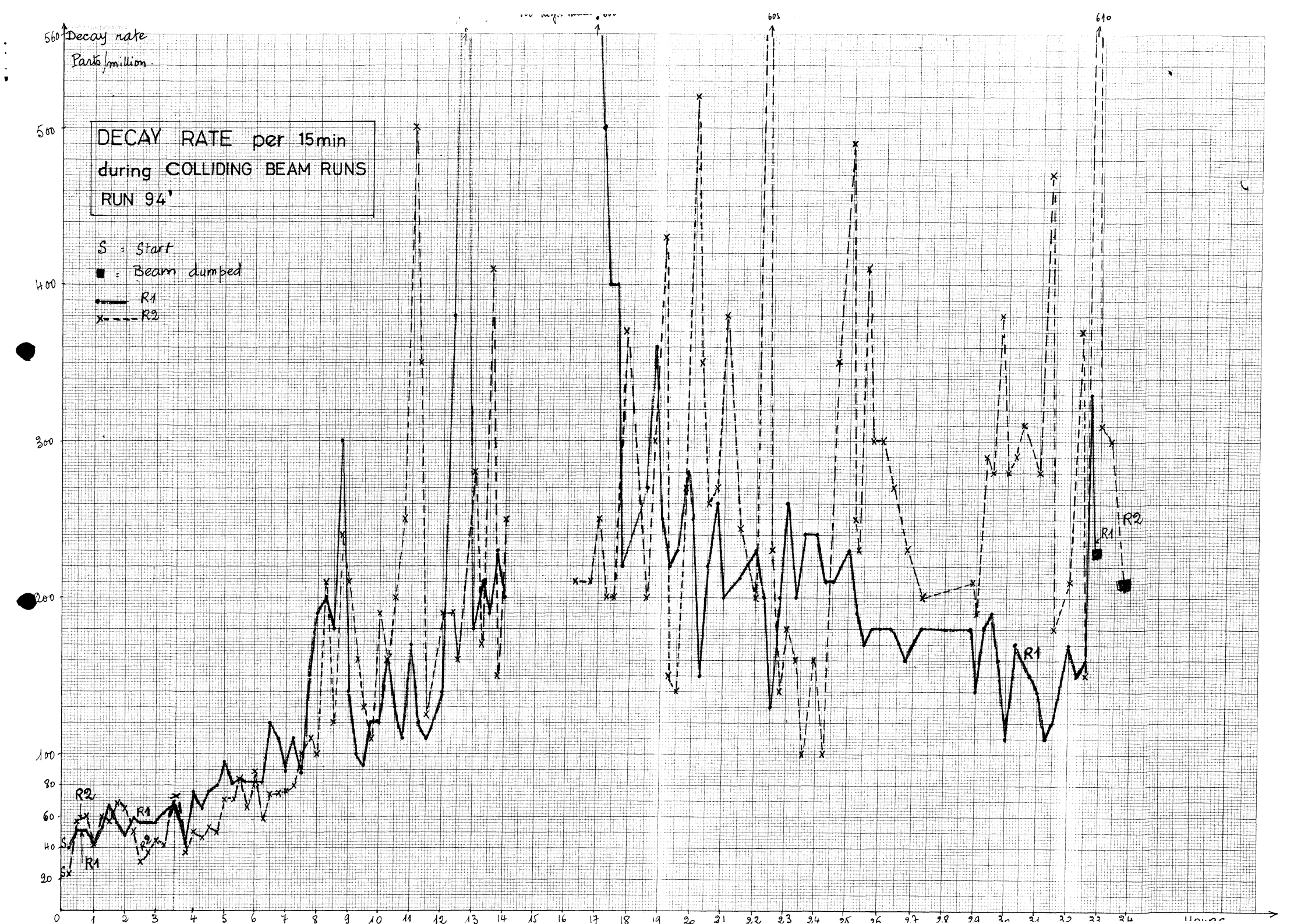

Decay rate
Parts/million
S = Start
■ = Beam dumped
Δ = Lost due to error
108'
105'
104'
DECAY RATE per 15 min.
during COLLIDING BEAM RUNS
RUN 104'
105'
108'
due to operations error
R2 (108')
108' (R2)
108' (R1)
105' (R2)
105' (R1)
104' (R2)
104' (R1)
R2 (105')
R1 (108')
R1 (105')
R2 (104')
R1 (104')
104 (R1 and R2)
Hours


Decay rate
Parts / million
S = Start
■ = Beam dumped
R2
unexplained
sudden loss
DECAY RATE per 15 min
during COLLIDING BEAM RUNS
RUN 103'
R1
R2
S R2 (103')
S R1 (103')
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Hours


DECAY RATE per 15 min
during COLLIDING BEAM RUNS
RUN 102'
Parts/million
S = Start
■ - Beam dumped
△ - lost due to error
I2 Septum changed
102' (R2) B'
102' (R2) B - after Refill
R2 - B
102' (R1) A
102' (R2) A
R1 △
R2
automatically dumped due to 18 KV dip
(thunder Storm at 02.46 hr)
R2 A
R1 A
R1 B'
102' (R1) B'
R2 - B
102' (R1) B after refill
R1 (102') B
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Refill next morning
Hours


Decay rate
Parts/million
DECAY RATE per 15 min.
during COLLIDING BEAM RUNS
RUN 101'
S = Start
■ = Beam dumped
500
400
300
200
100
90
80
70
60
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
S
R2
101 (R2)
R1
R2
S
101' (R1)


Decay rate
Parts/
800
810 800 820 880 860 810 840
900 2500 1600 3000
850
1200
820
dump
700
650
600
500
400
300
200
100
80
60
40
20
0
DECAY RATE per 15 min.
during COLLIDING BEAM RUNS
RUNS 95'
97'
S = Start
= Beam dumped
95'
97'
95' R1
97' R1
97' R2
95' R2
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Hours


Decay rate
Parts/million
DECAY RATE per 15 min
during COLLIDING BEAM RUNS
RUN 94'
S = Start
■ = Beam dumped
R1
R2
560
500
400
300
200
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
Hours