

ISR RUNNING INPreparation for physics in Runs 54 and 58Run 54, 18 May, 1971. 26.5 GeV/c, 4 bunches

The magnet settings used in this run are discussed by B. Autin and J-P. Gourber in a running-in report of May 24. The stacking and lifetime of the beam is discussed by L. Resegotti in a running-in report of May 21.

The luminosity curves measured during this run for intersecting points 2,5 and 6 are shown in figures 1 to 3 (sketched by J.C. Sens). Background curves for this run are available in our files.

The vertical closed orbit deviations in the intersecting points are indicated in the figures; they were not corrected.

Run 58, 24 May, 1971. 22.4 GeV/c, 20 bunches

The beam current limit for this run was set at 1.5 Amps on request of the physicists.

Ring 2 was filled to 1.536 A. Stacking was at the top with acceleration out to about 64 mm from the injection orbit. The working point was DANA.

Ring 1 was filled to 1.530 A. Stacking was at the bottom with acceleration to about 72 mm from the injection orbit. The working point was FATA.

Both beams were scraped at the inside and on the vertical dimension. The beam currents after this operation were  $i_1 = 1.4921$  A and  $i_2 = 1.4376$  A.

The vertical closed orbit deviations (Autin) were :

	<u>Ring 1</u>	<u>Ring 2</u>
I-1	- 1	+ 1.6 → corrected
I-2	- 0.1	- 1
I-5	+ 0.4	0
I-6	- 0.8	+ 2.3 → corrected

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The two largest deviations in Ring 2 were corrected.

The luminosity curves were measured with these beams in intersecting points 1, 2, 5 and 6. The curves were poor and showed an increase in the effective beam height of up to about 6 mm (compared with 5 mm in Run 54). Also the background values were high. (These curves are available in our files.)

It was observed that the stack in Ring 1 was vertically very large. After discussing the poor results it was concluded that the stack was made too far out (72 mm) touching probably a resonance at that location. Therefore a new stack was made this time at the top and accelerated to 64 mm from the injection orbit, (Hansen).

This stack did not touch the resonance and showed lower background values. No new curves could be measured in the remaining time.

The lifetime data for the beams are :

Ring 1	23.28 hr	1.5285 A	} decay rate = $1.2 \cdot 10^{-5}$ /min
	04.30 hr	1.5230 A	
Ring 2	23.28 hr	1.4205 A	} decay rate = $2.7 \cdot 10^{-5}$ /min
	01.00 hr	1.4170 A	

At 01.00 hr a current change in an experimental magnet in I-2 (experiment R202) caused a 3.3 mA loss in Ring 2.

Ring 2	01.17 hr	1.4137 A	} decay rate = $3 \cdot 10^{-5}$ /min
	04.30 hr	1.4056 A	

The beam size measurements with the scanning probes gave the following results :

	time	current loss due to measurement	inner	outer	lower	upper
Ring 1	22.50	1.5319 - 1.5306	- 23.9	+ 54.6	- 19.4	+ 12.9
	05.00	1.4835 - 1.4827	- 26.7	+ 65.3	- 23.4	+ 16.8
Ring 2	22.00	1.4248 - 1.4245	- 25.2	+ 54.5	- 21.2	+ 10.9
	04.45	1.4045 - 1.4033	- 20.4?	+ 54.5	- 22.3	+ 12.1

The difference in current in Ring 1 at 04.30 hr (1.5230 A) and 05.00 hr (1.4835 A) is due to scraping.

F. Bonaudi  
D. Neet

Distribution

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Run 54

18/5/71

LUMINOSITY I<sub>2</sub>

26.5/26.5 GeV

I<sub>1</sub> = 1.09 A

I<sub>2</sub> = 0.922 A

200  
COUNTS/180SEC

CLOSED ORBIT

R<sub>I</sub> = +0.7 mm

R<sub>II</sub> = -3 → -3.5 mm

$$\frac{L}{A_{up}^2} = 2 \times 10^{28} / \text{cm}^2 / \text{SEC} / \text{amp}^2$$

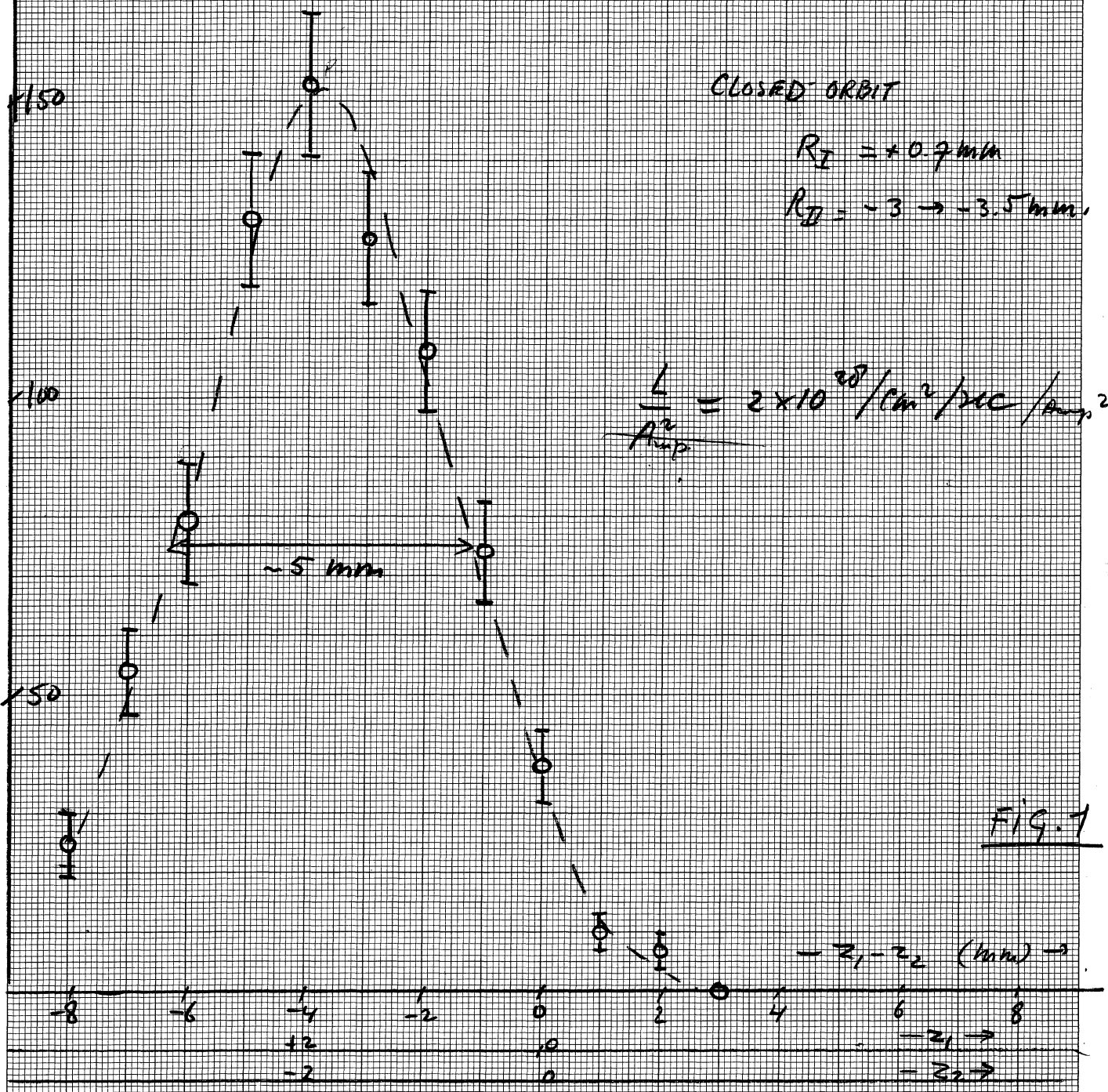


FIG. 7

Run 54

18/5/71

LUMINOSITY IS  
26.5/265 GeV

E<sub>19</sub> = 1400 GeV

SET AT

$Z_1 = +2.0$

$Z_2 = +4.0$

$I_1 = 1.09 \text{ A}$

$I_2 = 0.922 \text{ A}$

$\frac{L}{A^2} = 1.9 \times 10^{28} / \text{cm}^2/\text{sec}$

CLOSED ORBIT

$R_1 = 0.8 \text{ mm}$

$R_2 = -1.5 \text{ mm}$

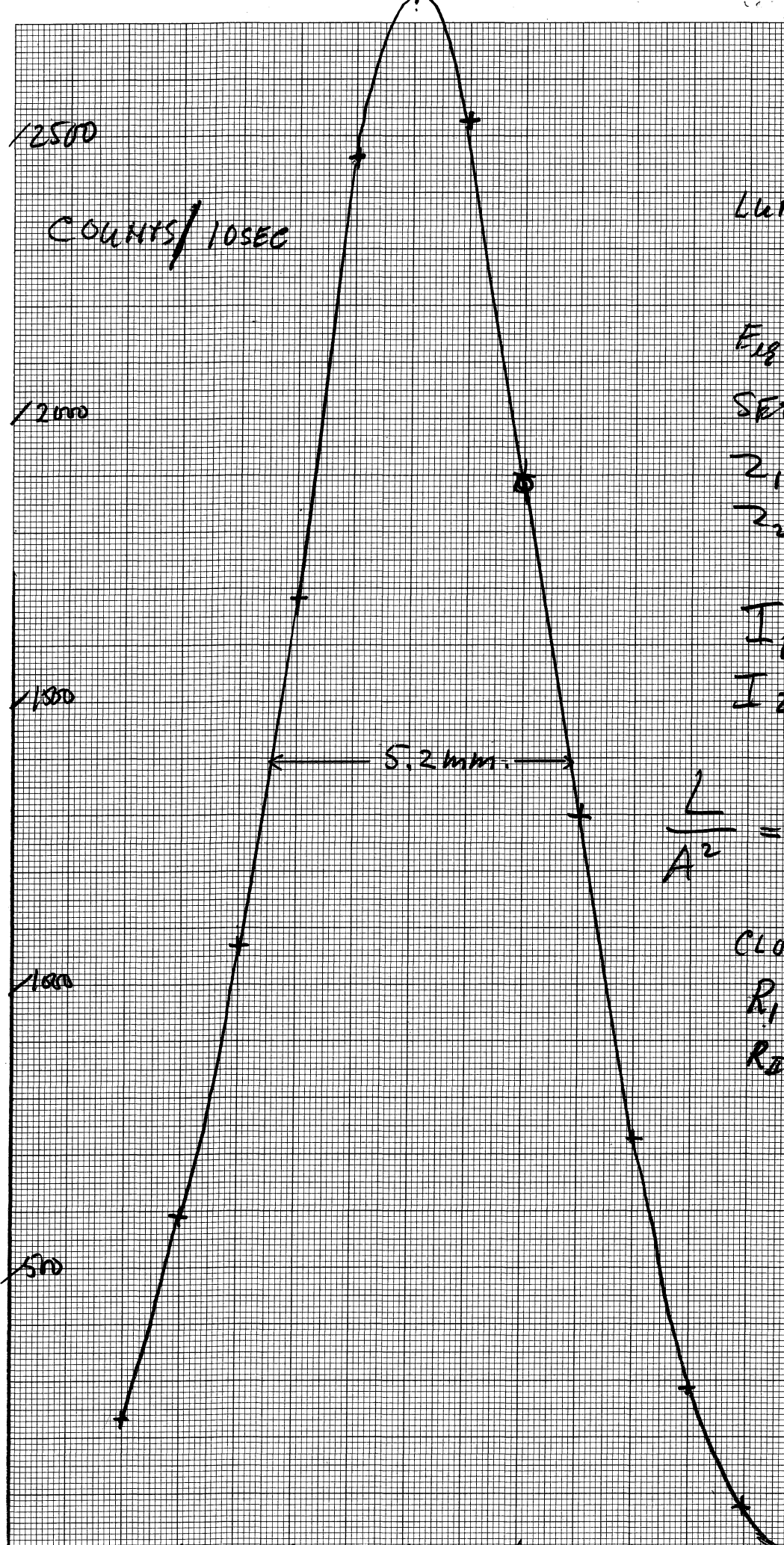


Fig 2

Z<sub>1</sub> - Z<sub>2</sub>

-8	-6	-4	-2	0	2	4	6	8			
0	0	0.5	1.0	1.5	+2.0	+2.5	+3	+3.5	+4.0	+4.5	+5.0
7	6.0	5.5	5	4.5	+4.0	+3.5	+3	+2.5	+2.0	+1.5	+1.0



Run 54

10/5/71

LUMINOSITY I6

26.5/26.5 GeV

$I_1 = 1.09 \text{ A}$

$I_2 = 0.921 \text{ A}$

CLOSED ORBIT

$R_I = 2.5 \text{ mm}$

$R_{II} = 3 \text{ ''}$

SET AT

$R_I = +0.3 \text{ mm}$

$R_{II} = -0.3 \text{ ''}$

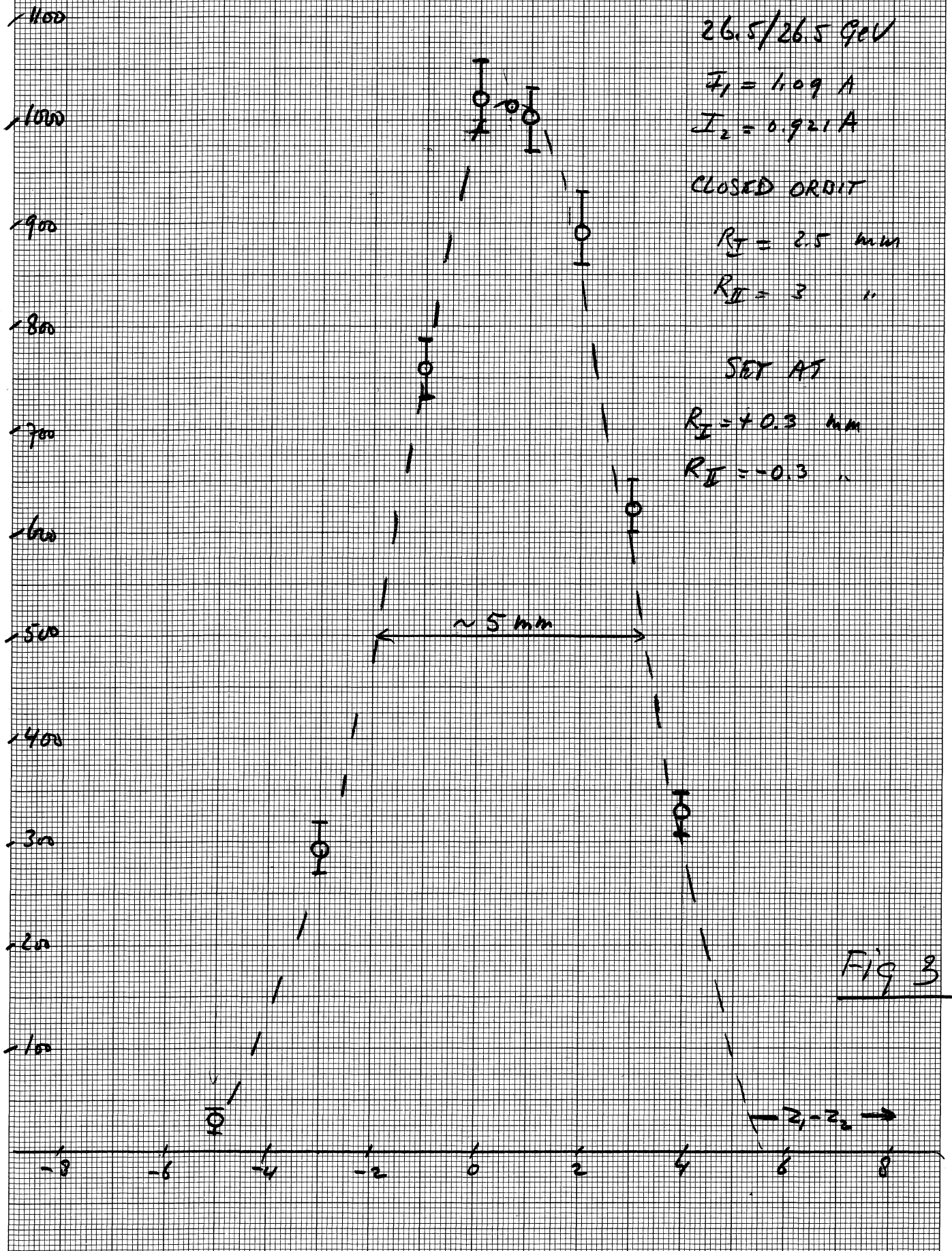


Fig 3