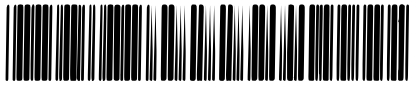

ISR-OP/FL/svw

18th December, 1972

PERFORMANCE REPORT

RUN 264 - 26 GeV/c - Ring 1

2C26 WORKING LINE - 60% Shaving

An attempt to reduce Background in I2 during repetitive injection and acceleration in R1 with high shaving gives evidence for positioning the front and rear part of the dump block at -8 mm when shaving 60% of injected beam.

Object : Vertical position optimization of the R1 dump block to decrease the number of scattered particles going into I2 region during high shaving mode filling.

Since the beginning of the vertical shaving operation a few months ago, momentary pressure bumps (in VG 165.2) and high R1 background which decays in time are observed in I2. In addition there is evidence for higher than normal induced radioactivity upstream of I2 (D207 magnet).

This could be explained by particles scattered at injection on the vertical scraper target in I3 (β = 50 m) flowing through the dump block aperture (front β= 15 m and rear β= 17 m) a few metres downstream and being scattered (eventually after several revolutions) into the I2 region. (H. Laeger, ISR Performance Report 19th October, 1972).

In order to stop a maximum of scattered particles in the dump block we moved it. Particle flux outside the vacuum chamber was monitored :

a) by ionisation chambers nos. 1 and 2 placed in the front and rear of the dump block respectively

b) by ionisation chamber no. 3 placed near VG 165.2 (downstream of I2 where pressure bumps were observed), and

c) by 3 scintillator telescope looking at this gauge with an angle of ~ 45%. Unfortunately this monitor (as well as I2 physicist monitor) was saturated during repetitive injection and its information is not useful for this report.

1. Firstly the dump block was moved with parallel displacement from -9 mm to +8 mm with 1 mm steps, 0 mm corresponding to the dump block centered.

   Fig. 1 shows 3 curves corresponding to particle fluxes crossing ionisation chambers nos. 1, 2 and 3 respectively. The first is rather flat and shows that the ionisation chamber no. 1 was certainly placed too high above the beam to see any difference.

   The second one, symmetric (but also with ionisation chamber no. 2 not placed in an optimum position) indicates that more particles are stopped in the dump block when its internal sides are nearer the beam. Finally, Curve 3 from ionisation chamber no. 3 shows that particle loss in I2 is reduced by a factor 3 when the dump block is off-centered from 0 to + or - 8 mm.

2. In the second part of the experiment, the upstream end of the dump block was maintained at -4 mm and the downstream end displaced from -9 mm to +0.5 mm

   Figure 2 shows curves 1, 2 and 3 from ionisation chambers 1, 2 and 3 as before. Curve 2 shows evidence for more particles stopped in the rear part of the dump block when it comes close to the beam (-9 mm position of the rear means it is only placed at -7 mm above the beam center).

   Curve 3 shows a minimum of scattered particles coming in I2 when the rear is around -7 mm.

Conclusion

Remembering that the dump block in R1 must be placed, during repetitive injection and dumping, at minus values for beam dumping reasons and finding no strong difference between parallel and inclined block optimum positions, we proposed, for practical operations, to position it with front and rear part to -8 mm.

Further measurements will be done to minimise R1 background in I2 when scraping stacks.

F. Lemeilleur

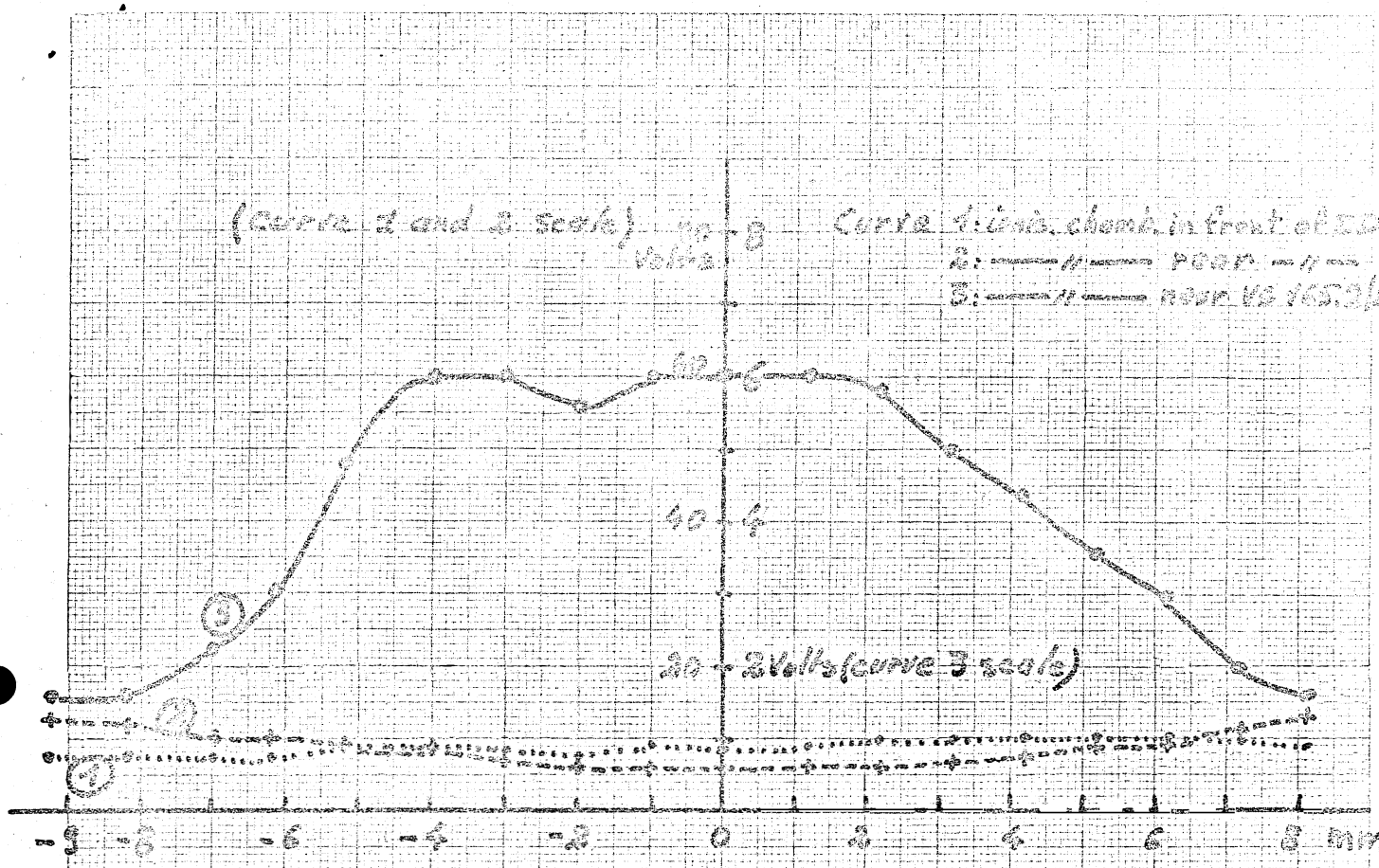

Figure 1.- Dump block with parallel displacement.

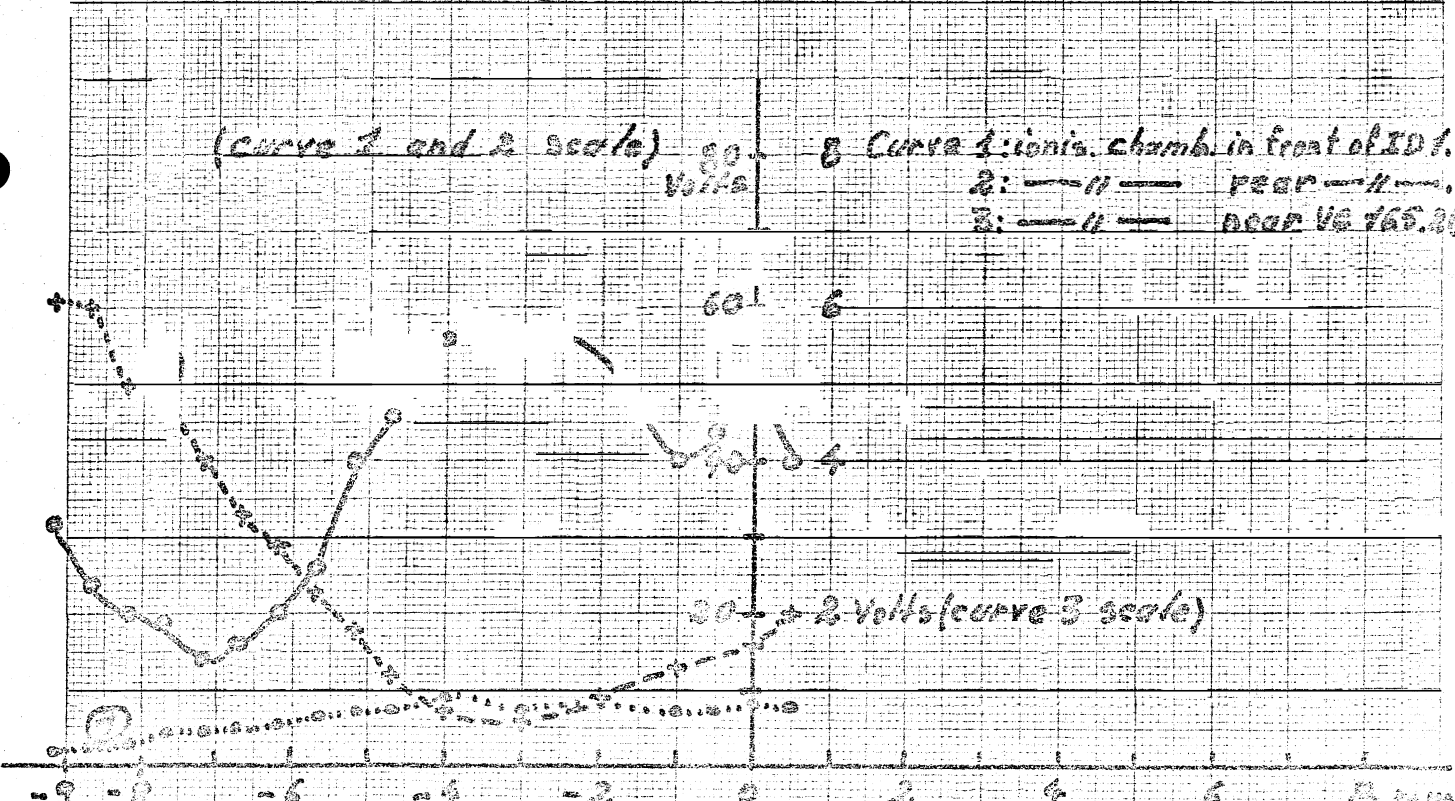

Figure 2.- Rear of dump block moved (front fixed 6 - 4 mm)