

MEASUREMENTS DURING THE M.D. - 22.3.1968

Preliminary results on the measurements and calibrations of monitors in the e₄ beam are given below :

Conditions : Fast slow ejection 58 : 19.2 GeV/c , 1.6 s, repetition
 Q: 55 , 258 A .
 Sextupoles (+5, -15, +35, -45, -95) : 23.6 A
 Bumpcoils : 80 A
 Ejection efficiency : 50%
 Beam condition : as for weeks 11/12

1. Calibration measurement (inside the ring)
 with foils exposed at position TV 4

Transformer (Battisti)	1.26x10 ¹⁴
Monitor (TV 3)	32 202
Number of protons from Na ²⁴ (γ)	1.11x10 ¹⁴ ± 2.4%
Monitor	293 mV/10 ¹¹ p

2. Calibration measurement with foils at position TV 4 and TV 8

Number of protons (transformer Battisti)	1.05x10 ¹⁴	
Monitor (at TV3)	27 117	} TV 3 : 298 mV/10 ¹¹ p
Number of protons (from Na ²⁴ (γ) at TV 4)	<u>0.91x10¹⁴</u> ± 2.45%	
SEC	59 454	SEC-factor 1.5x10 ⁹
Number of protons (from Na ²⁴ (γ) at TV 8)	<u>0.88x10¹⁴</u> ± 2.62%	} TV 8 :195mV/10 ¹¹ p
Monitor (at TV 8)	17 154	

3. Effect of preceeding monitors on the decrease of the singals

with monitor TV 2

Transformer (Battisti)	3.1 %
SEC	1.5 %
Monitor TV 8	2.1 %

Remarks : The ejection efficiency was about 50 %. The relative stability of the efficiency during the time of measurement was better than 1%. This refers to the measurements with the transformer without monitor TV 2. Monitor TV 2

obviously influences the beam and therefore the transformer reading (see above). The signal on the target k_8 drops by 30% introducing monitor TV 2, and the radiation level in the hall increases simultaneously (in an extreme case of the radiation monitor A5 by a factor 2 to 3).

The relative stability between transformer, SEC and monitor TV 8 was better than 1%.

4. Background during the time interval of 1 burst.

TV 3	0.33
SEC	7.02
TV 8	3.01

With the ejection operating, but beam stopper closed, the background increases from 3 to 3.6 for monitor TV 8.

The calibration given in Table 2 are not corrected for the background.

5. The signal of the transformer and SEC as function of the intensity is shown in Fig. 1

6. Comparison between transformer and foils

Taking the background of the transformer with 1.13×10^{10} /burst into account, the agreement between foils and transformer is better than 10% (the transformer indicates a flux 8 to 9% higher than the foils).

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TABLE 1 Ratio between the "charge-monitors"

MONITOR TV2/TV8	MONITOR TV3/TV2	MONITOR TV3/TV8	REMARKS
1.28	1.25	1.55	Monitor TV 2 and TV 3 in the beam
1.25	-	-	" TV 2 in the beam
-	-	1.60	" TV 3 in the beam

TABLE 2

MONITOR	SIGNAL/ 10^{11} p
TV 2	236 mV
TV 3	295 mV
TV 8	195 mV

e4 SLOW EJECTED PROTON BEAM MONITORS LINEARITY

Each point is the mean value of 10 successive bursts

