

Emittance Measurements at 750 keV, 10 MeV and 200 MeV

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An attempt was made to measure the emittance at 50 KeV, 10 MeV and 200 MeV to determine emittance growth through the 200 MeV linac. Successful measurements were made at 750 KeV and 10 MeV but in moving the amplifiers to the 200 MeV location a problem developed and no 200 MeV data was taken by the slit method. SER profiles were taken at 200 MeV and that data is included with the 50 KeV and 10 MeV data for comparison. The results are as follows:-

LOCATION	NORMALIZED 90% EMITTANCE (EPR)		BEAM CURRENT
	HORIZONTAL	VERTICAL	
VB #5	0.68 cm mRad.	0.50 cm mRad.	75 mA
10 MeV	1.62 cm mRad.	1.13 cm mRad.	50 mA
10 MeV	1.08 cm mRad.	1.40 cm mRad.	50 mA

750 KeV VB#5
HORIZONTAL
BUNCHES #2 ONLY

EMITTANCE UNIT LOCATION	VBS
PLANE OF MEASUREMENT	HDR
EMITTANCE UNIT NUMBER	2
BEAM CURRENT IN MILLI. AMPS.	75
THRESHOLD STEP SIZE IN MILLI. VOLTS.	20
NOISE LEVEL IN MILLI. VOLTS.	5
UPPER LEVEL IN MILLI. VOLTS.	500

XBEAM CURRENT VS. PHASE SPACE AREA

XI		
100.00<		* 29.53
		* 21.87
90.00<		* 16.87 at 90%
		* 14.32
80.00<		* 11.99
		* 10.44
70.00<		* 8.658
60.00<	* 7.437	
	* 6.327	
50.00<	* 5.217	
	* 4.662	
40.00<	* 3.663	
30.00<	* 2.775	
	* 2.442	
20.00<	* 1.665	
	* 1.332	
	* 1.110	
10.00<	* 0.666	
	* 0.555	
	* 0.333	

750 KeV VBS
HORIZONTAL
BUNCHER #2 ONLY

750KeV VB#5

VERTICAL

BUNCHER #2 ONLY

PLANE OF MEASUREMENT	VERT
EMISSION UNIT NUMBER	2
BEAM CURRENT IN MILLI. AMPS.	75
THRESHOLD STEP SIZE IN MILLI. VOLTS.	20
NOISE LEVEL IN MILLI. VOLTS.	5
UPPER LEVEL IN MILLI. VOLTS.	500

XBEAM CURRENT VS. PHASE SPACE AREA

%I
100.00<	* 24.64

* 16.98

* 13.88

90.00<

~ 12.5 at 90%

* 11.77

* 9.546

80.00<

* 7.548

70.00<

* 6.549

* 5.772

* 5.439

60.00<

* 4.551

750 KeV VB #5

VERTICAL

* 4.107

* 3.774

50.00<

* 3.441

* 2.775

40.00<

* 2.331

* 2.220

30.00<

* 1.887

* 1.665

* 1.554

20.00<

* 0.999

10.00<

RRER 0.500CM. MRADS. PER POINT

PLANE OF MEASUREMENT	VERT
EMITTANCE UNIT NUMBER	3
BEAM CURRENT IN MILLI. AMPS.	50
THRESHOLD STEP SIZE IN MILLI. VOLTS.	20
NOISE LEVEL IN MILLI. VOLTS.	5
UPPER LEVEL IN MILLI. VOLTS.	500

BEAM CURRENT VS. PHASE SPACE AREA

NI
100.00 * 10.63

90.00 * 6.625
7.5 at 90%

* 5.000

80.00 * 4.125

70.00 * 3.250

* 2.875

* 2.500

60.00 * 2.125

10 MeV VERTICAL
BUNCHER #2 ONLY

50.00 * 1.625

* 1.375

40.00

* 1.000

30.00

* 0.750

* 0.625

20.00

* 0.375

10.00 * 0.250

AREA 0.300 CM. MRADS. PER POINT

10MeV HORIZONTAL
BUNCHER #2 ONLY

HOR
3
50
20
5
500

00.00 20.00

* 11 99

99.000

70.00¢

* 5.750

60.00¢

* 3.875

* 3.375

* 3.000

50.00¢

* 2.750

* 2.250

40.000

* 1.875

30. 00<

* 1.375

* 1.125

20.000

* 0.750

15. 000

* 0.375

* 0.250

AREA 0.400CM. MRADS. PER POINT

701.40