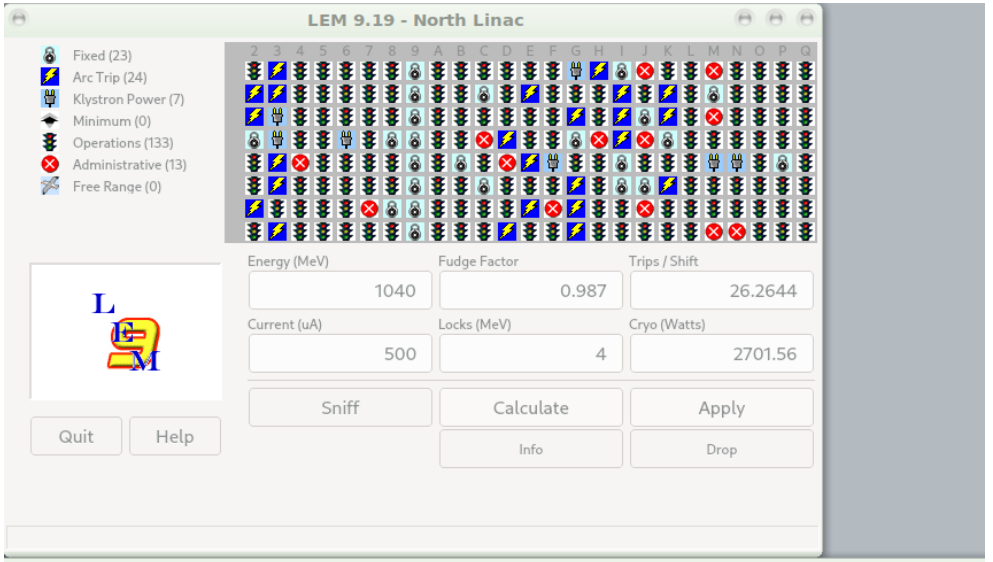
Energy Estimate 17 March 2025

Jay Benesch

Bottom line: everything possible

- North Linac 1130 MeV
- South Linac 1100 MeV

NL Lem



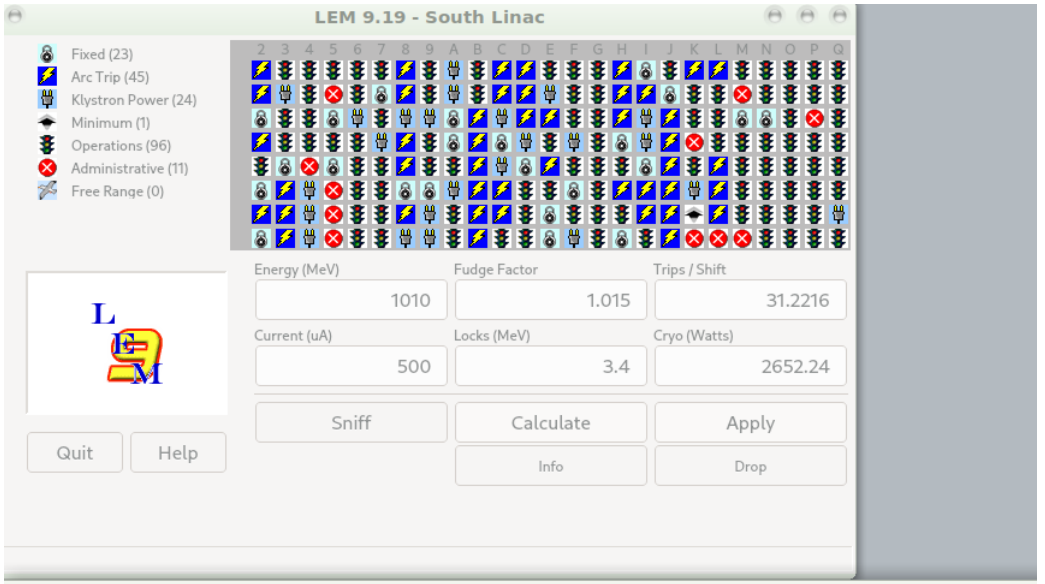
LEM 9.19 - North Linac

Gradients | Zone Power | Magnet BDL | Skew Quad BDL | Cryo Load | Apply History

Zone	1	2	3	4	5	6	7	8
1L02	**4.5/ 6.7**	**4.3/ 7.8**	**4.3/ 7.4**	0.0/ 0.0	**7.1/ 8.9**	4.0/ 4.0	**3.6/ 7.9**	**3.0/ 9.0**
1L03	**3.0/ 4.8**	**3.0/ 7.4**	**6.5/10.1**	7.9/ 7.9	**3.0/ 3.7**	**3.7/ 5.7**	**4.7/ 7.1**	**3.1/ 6.7**
1L04	10.3/10.3	13.3/13.3	11.4/11.4	12.2/12.2	13.2/13.2	13.8/13.8	11.4/11.4	12.9/12.9
1L05	11.7/11.7	12.5/12.5	16.2/16.2	16.0/16.0	12.7/12.7	11.6/11.6	9.8/ 9.8	8.0/ 8.0
1L06	9.2/ 9.2	7.0/ 7.0	10.3/10.3	10.5/10.5	11.0/11.0	11.4/11.4	11.2/11.2	9.8/ 9.8
1L07	10.8/10.8	11.0/11.0	7.7/ 7.7	6.8/ 6.8	10.8/10.8	8.6/ 8.6	11.8/11.8	10.0/10.0
1L08	5.2/ 5.2	5.4/ 5.4	6.1/ 6.1	0.0/ 0.0	5.4/ 5.4	8.5/ 8.5	0.0/ 0.0	8.2/ 8.2
1L09	**3.0/ 0.0**	**3.0/ 0.0**	**3.0/ 0.0**	**3.0/ 0.0**	**3.0/ 0.0**	**3.0/ 0.0**	**3.0/ 0.0**	**3.0/ 0.0**
1L10	11.0/11.0	14.3/14.3	14.0/14.0	14.1/14.1	14.5/14.5	16.1/16.1	13.3/13.3	10.2/10.2
1L11	7.9/ 7.9	7.5/ 7.5	9.3/ 9.3	10.5/10.5	0.0/ 0.0	7.6/ 7.6	11.8/11.8	9.0/ 9.0
1L12	8.1/ 8.1	0.0/ 0.0	13.1/13.1	10.1/10.1	11.3/11.3	0.0/ 0.0	12.3/12.3	12.3/12.3
1L13	10.0/10.0	10.9/10.9	12.4/12.4	**10.7/12.4**	8.5/ 8.5	9.9/ 9.9	10.9/10.9	**10.6/11.1**
1L14	**4.5/ 7.1**	**5.0/ 8.0**	**8.0/10.0**	**6.0/ 7.0**	**3.7/ 6.6**	**3.0/10.0**	**4.2/ 8.0**	**7.5/ 8.0**
1L15	12.7/12.7	9.5/ 9.5	6.9/ 6.9	11.5/11.5	9.5/ 9.5	11.3/11.3	13.1/13.1	8.5/ 8.5
1L16	5.8/ 5.8	**4.4/ 6.9**	**3.0/ 5.9**	0.0/ 0.0	**3.6/ 5.4**	**3.7/ 5.5**	**3.8/ 5.9**	**3.1/ 5.3**
1L17	**5.9/ 8.5**	**3.0/ 8.0**	11.6/11.6	**3.0/ 5.0**	**5.2/ 6.6**	7.9/ 7.9	8.5/ 8.5	8.1/ 8.1
1L18	0.0/ 0.0	**4.0/ 6.9**	**3.0/ 3.3**	**3.1/ 4.4**	0.0/ 0.0	0.0/ 0.0	**5.1/ 7.9**	**3.0/ 9.8**
1L19	**3.5/ 5.0**	**5.0/ 8.8**	0.0/ 0.0	**3.5/ 6.9**	**4.0/ 7.3**	0.0/ 0.0	**3.5/ 5.1**	**3.5/ 4.0**
1L20	7.4/ 7.4	**3.0/ 4.0**	**3.5/ 5.3**	0.0/ 0.0	**3.0/ 3.4**	**3.2/ 8.5**	**5.0/ 6.6**	**3.7/ 5.4**
1L21	3.7/ 3.7	6.4/ 6.4	8.8/ 8.8	9.5/ 9.5	4.8/ 4.8	5.5/ 5.5	3.6/ 3.6	4.5/ 4.5
1L22	16.8/16.8	0.0/ 0.0	19.1/19.1	15.3/15.3	20.2/20.2	15.8/15.8	18.1/18.1	20.1/20.1
1L23	10.8/10.8	14.6/14.6	12.9/12.9	20.3/20.3	15.3/15.3	12.3/12.3	16.7/16.7	13.3/13.3
1L24	7.0/ 7.0	13.5/13.5	16.0/16.0	17.7/17.7	15.0/15.0	15.0/15.0	17.7/17.7	15.0/15.0
1L25	14.0/14.0	10.0/10.0	12.0/12.0	14.0/14.0	0.0/ 0.0	15.0/15.0	18.5/18.5	18.5/18.5
1L26	11.0/11.0	10.0/10.0	8.9/ 8.9	15.0/15.0	11.5/11.5	15.5/15.5	15.0/15.0	16.5/16.5

Gradients in MeV/Meter (current/calculated)

SL lem



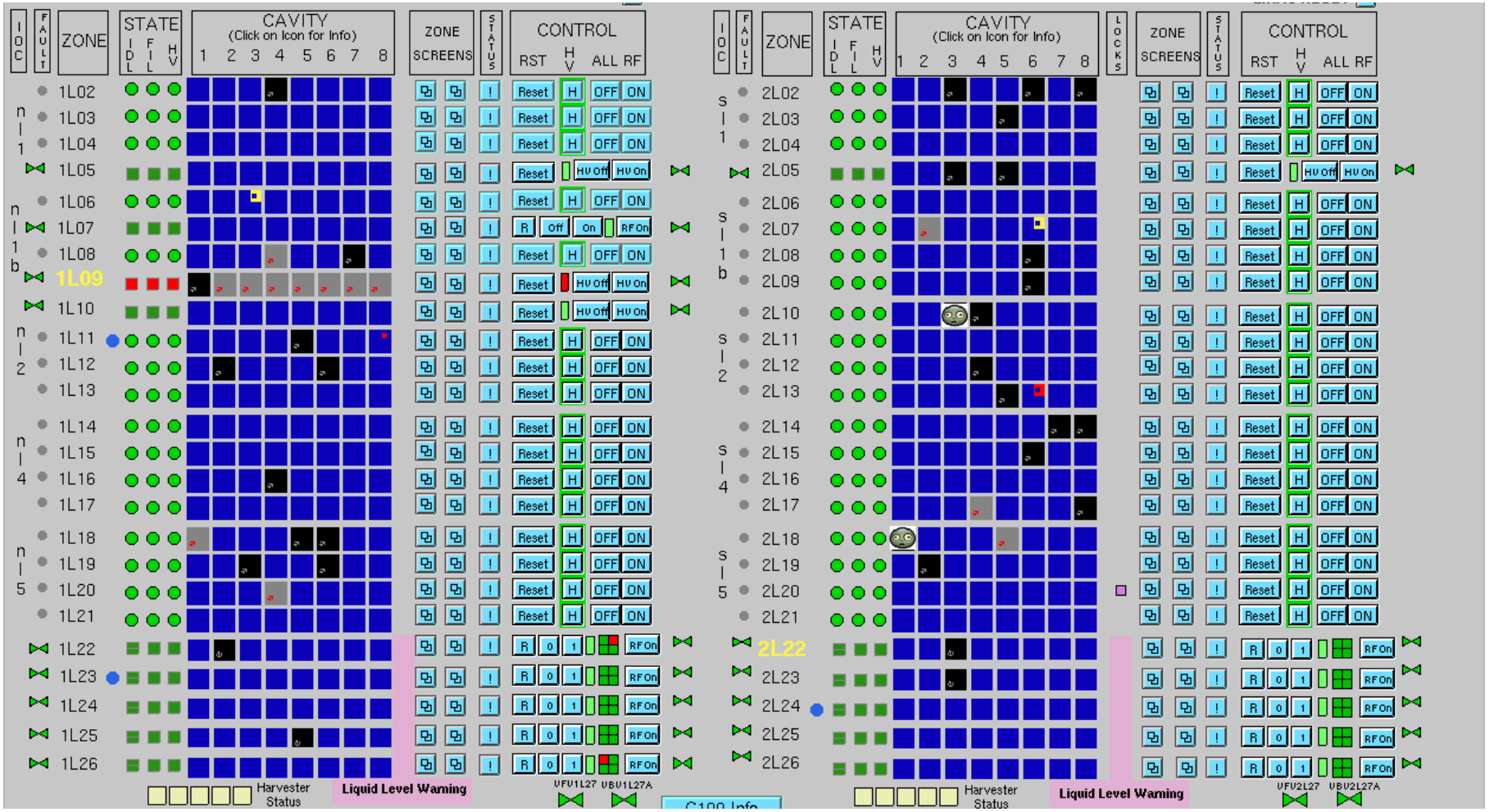
LEM 9.19 - South Linac

Gradients | Zone Power | Magnet BDL | Skew Quad BDL | Cryo Load | Apply History

Zone	----1----	----2----	----3----	----4----	----5----	----6----	----7----	----8----
2L02	**4.0/ 6.2**	**6.1/ 7.0**	0.0/ 0.0	**7.2/ 7.9**	3.6/ 3.6	0.0/ 0.0	**5.6/ 6.5**	0.0/ 0.0
2L03	5.3/ 5.3	10.3/10.3	5.2/ 5.2	5.3/ 5.3	0.0/ 0.0	**5.1/ 5.7**	**3.5/ 4.4**	**5.6/ 6.4**
2L04	11.0/11.0	13.0/13.0	10.4/10.4	11.4/11.4	14.0/14.0	12.8/12.8	12.9/12.9	9.7/ 9.7
2L05	14.0/14.0	18.0/18.0	0.0/ 0.0	10.0/10.0	0.0/ 0.0	18.0/18.0	10.7/10.7	11.0/11.0
2L06	6.0/ 6.0	8.8/ 8.8	8.4/ 8.4	8.4/ 8.4	6.7/ 6.7	8.5/ 8.5	7.5/ 7.5	7.3/ 7.3
2L07	10.4/10.4	0.0/ 0.0	9.7/ 9.7	8.6/ 8.6	10.7/10.7	9.8/ 9.8	9.2/ 9.2	6.0/ 6.0
2L08	**5.5/ 7.5**	**4.7/ 5.5**	**6.0/ 8.3**	**6.2/ 6.7**	**5.3/ 6.3**	0.0/ 0.0	**6.7/ 8.2**	6.4/ 6.4
2L09	11.8/11.8	9.0/ 9.0	12.2/12.2	11.4/11.4	11.8/11.8	0.0/ 0.0	12.8/12.8	11.7/11.7
2L10	7.5/ 7.5	10.7/10.7	0.0/ 0.0	0.0/ 0.0	7.8/ 7.8	8.9/ 8.9	7.5/ 7.5	10.4/10.4
2L11	8.3/ 8.3	6.3/ 6.3	**4.7/ 5.8**	**6.1/ 7.2**	**4.7/ 6.0**	**7.2/ 8.4**	**5.4/ 6.0**	**5.4/ 6.0**
2L12	**4.0/ 4.7**	**6.0/ 7.1**	7.6/ 7.6	0.0/ 0.0	11.0/11.0	**3.4/ 5.4**	**4.8/ 6.0**	4.8/ 4.8
2L13	**6.3/ 7.1**	**8.0/ 8.2**	**7.4/ 9.1**	**7.7/10.5**	0.0/ 0.0	4.3/ 4.3	9.1/ 9.1	4.8/ 4.8
2L14	**5.5/ 6.8**	**7.5/ 7.6**	**6.3/ 7.4**	**8.6/ 9.9**	**6.3/ 7.5**	**7.1/ 8.0**	0.0/ 0.0	0.0/ 0.0
2L15	8.7/ 8.7	11.3/11.3	9.0/ 9.0	12.4/12.4	6.0/ 6.0	0.0/ 0.0	13.1/13.1	11.5/11.5
2L16	8.0/ 8.0	9.6/ 9.6	3.5/ 3.5	8.0/ 8.0	9.7/ 9.7	6.9/ 6.9	9.3/ 9.3	7.8/ 7.8
2L17	**4.8/ 5.8**	**3.4/ 4.1**	**4.4/ 5.0**	0.0/ 0.0	6.9/ 6.9	**4.9/ 5.7**	5.1/ 5.1	0.0/ 0.0
2L18	0.0/ 0.0	**6.5/ 7.6**	8.5/ 8.5	**7.5/ 7.6**	0.0/ 0.0	**6.1/ 7.3**	**6.0/ 7.1**	10.3/10.3
2L19	**8.2/ 8.5**	0.0/ 0.0	**6.1/ 7.3**	**5.1/ 6.7**	**6.4/ 7.6**	**6.0/ 7.2**	**5.9/ 7.2**	**6.1/ 7.8**
2L20	**6.3/ 7.8**	5.8/ 5.8	7.1/ 7.1	**4.4/ 5.0**	5.5/ 5.5	**6.6/ 7.3**	3.9/ 3.9	**5.3/ 6.1**
2L21	**5.4/ 6.3**	5.5/ 5.5	**6.6/ 6.7**	**5.7/ 6.8**	**3.0/ 3.1**	**3.4/ 4.6**	**4.4/ 5.9**	10.3/10.3
2L22	10.2/10.2	19.6/19.6	0.0/ 0.0	16.0/16.0	16.1/16.1	21.3/21.3	18.8/18.8	18.5/18.5
2L23	18.0/18.0	16.6/16.6	0.0/ 0.0	12.5/12.5	17.6/17.6	16.1/16.1	17.4/17.4	17.8/17.8
2L24	20.0/20.0	20.0/20.0	20.0/20.0	12.0/12.0	12.0/12.0	20.0/20.0	14.5/14.5	20.0/20.0
2L25	8.0/ 8.0	20.0/20.0	22.0/22.0	20.0/20.0	20.0/20.0	20.0/20.0	18.0/18.0	16.7/16.7
2L26	10.0/10.0	20.0/20.0	20.0/20.0	18.0/18.0	18.3/18.3	18.0/18.0	19.7/19.7	17.0/17.0

Gradients in MeV/Meter (current/calculated)

RF Captain


IOC
FAULT
ZONE
STATE
IDL FIL HV
CAVITY
(Click on Icon for Info)
1 2 3 4 5 6 7 8
ZONE SCREENS
STATUS
CONTROL
RST HV ALL RF
1L02
1L03
1L04
1L05
1L06
1L07
1L08
1L09
1L10
1L11
1L12
1L13
1L14
1L15
1L16
1L17
1L18
1L19
1L20
1L21
1L22
1L23
1L24
1L25
1L26
Reset
H
OFF ON
HV Off HV On
R Off On RF On
R 0 1 RF On
Harvester Status
Liquid Level Warning
VFV1L27 VBV1L27A
2L02
2L03
2L04
2L05
2L06
2L07
2L08
2L09
2L10
2L11
2L12
2L13
2L14
2L15
2L16
2L17
2L18
2L19
2L20
2L21
2L22
2L23
2L24
2L25
2L26
LOCKS
VFV2L27 VBV2L27A

North Linac

cavities with locks on lem that might be recovered			**min(B,C)**
cavity	cavity_capacity_may2024_MeV	ODVH_13mar_MeV	
1L02-4	3.64	3.8	3.64
1L08-7	2.45	7	2.45
1L11-5	5.70	5.7	5.70
1L12-6	4.35	4.35	4.35
1L16-4	2.42	3.3	2.42
1L18-1	2.40	4.1	2.40
1L18-5	2.00	2.45	2.00
1L18-6	3.43	4	3.43
1L19-3	3.06	2.8	2.80
1L19-6	2.66	3.65	2.66
1L20-4	3.57	3.85	3.57
1L22-2	13.3	13.3	13.3
1L25-5	11	8.4	13.3
NL sum	45.4	54.5	**45.1**

NL	lem	1040
	recovery 13 cavities	45.1
	1L09	47
	total	**1132**

South Linac

cavities with locks on lem that might be recovered			min(B,C)
2L02-3	3.22	3.65	3.22
2L02-6	4.55	4.45	4.45
2L02-8	2.73	3.4	2.73
2L03-5	2.14	3.05	2.14
2L05-3	8.60	8.6	8.60
2L07-2	4.07	4.1	4.07
2L08-6	3.03	3.35	3.03
2L09-6	6.08	3	3.00
2L10-4	4.45	4.45	4.45
2L12-4	2.92	5.1	2.92
2L13-5	5.20	3.6	3.60
2L14-7	3.90	5	3.90
2L14-8	3.44	3.9	3.44
2L15-6	4.57	2.55	2.55
2L17-4	3.74	4.1	3.74
2L17-8	2.46	2.35	2.35
2L18-5	3.01	3.62	3.01
2L19-2	3.39	4.4	3.39
2L22-3	12.66	12.74	12.66
2L23-3	11.43	11.48	11.43
SL sum	95.59	96.89	**88.7**

SL	lem	1010
	recovery 20 cavities	88.7
	total	**1099**

NDX


10
8
6
4
2
0
2025-03-17
03:00:00.00
2025-03-17
05:00:00.00
2025-03-17
07:00:00.00
Y axis: linear manual untiled X axis: 2 hours Mya: ops
INX1L05_nDsRt
INX1L06_nDsRt
INX1L07_nDsRt
INX1L08_nDsRt
INX1L10_nDsRt
INX1L11_nDsRt
INX1L16_nDsRt
INX1L22_nDsRt
INX1L23_nDsRt
INX1L24_nDsRt
INX1L25_nDsRt
INX1L26_nDsRt
INX1L27_nDsRt
INX1S01_nDsRt
INX7A15_nDsRt
10
8
6
4
2
0
2025-03-17
03:00:00.00
2025-03-17
05:00:00.00
2025-03-17
07:00:00.00
Y axis: linear manual untiled X axis: 2 hours Mya: ops
INX2L04_nDsRt
INX2L06_nDsRt
INX2L08_nDsRt
INX2L10_nDsRt
INX2L11_nDsRt
INX2L16_nDsRt
INX2L17_nDsRt
INX2L22_nDsRt
INX2L23_nDsRt
INX2L24_nDsRt
INX2L25_nDsRt
INX2L26_nDsRt
INX2L27_nDsRt
INX2S01_nDsRt
INX8A15_nDsRt
25
20
15
10
5
0
2025-03-17
03:00:00.00
2025-03-17
05:00:00.00
2025-03-17
07:00:00.00
Y axis: linear manual untiled X axis: 2 hours Mya: ops
INXNLC100_nDsRt_Sum+I
INXNL_nDsRt_Sum
INXSLC100_nDsRt_Sum
INXSL_nDsRt_Sum
INXNLC100_nDsRt_Sum