

SNS End-to-End Simulation: Assumptions & Summary

	IS/LEBT	RFQ	MEBT	DTL	CCL	SCL (1)	SCL (2)	HEBT	Ring	RTBT	Target	Unit
Energy, W (in)		0.065	2.5	2.5	86.8	185.6	382.2 (+/-)	972.3 (+/-)	972.3 (+/-)	972.3 (+/-)	972.3 (+/-)	MeV
DW							0.26-0.43	0.5	65+65 120+120	65+65 120+120		mm mr mm mr
e (n, rms)	0.09/0.2	0.21	0.27									mm
e (un, 99%)												mm
DE (rms)		0.009	0.017				0.33					MeV
DE (com)							2.2 (+/-)	0.2 (+/-)				MeV
DE (full)								4 (+/-)	10 (+/-)	10 (+/-)		MeV
I (out, peak)	65	52	52	52	52	52	52	52				mA
Length	0.12	3.72	3.66	36.81	57.47	64.229	172.45	169.49	248	150.75		m
Codes used	IGUN	PARMTEQ	PARMILA	PARMILA	PARMILA	PARMILA	PARMILA	PARMILA	UAL/ORBIT	PARMILA		
N (macro)	200	1e4/1e6	1e4/1e6	1e6/1e5	1e6/1e5	1e6/1e5	1e6/1e5		1e6/1e5			
random seeds	1	100	100	1/10	1/10	1/10	1/10		1/10			
Loss (control)									0.02 - 0.1			%
Loss (uncont.)									0.0001			%
e (rms) growth												
e (99%) growth												
Included	sp. ch. Initial electrns Ion temp	sp. ch.	sp. ch. Quad mag. Err	space charge rf phase/amp. error quad gradient error quad roll cavity-to-cavity tilt	space charge rf phase/amp. error quad gradient error Lorentz detuning quad roll cavity-to-cavity tilt					painting space charge magnet error aperture magnet offset		
Excluded	Dumping mag field misalign	Magn. errors		quad misalignment multipoles	quad misalignment multipoles missing cavities rematching					impedance electron cloud scattering beam loading collimation fringe field quad roll		
Open issues	no direct LEBT-RFQ handover will use msrd LEBT distrib.s								ext kicker imp			

Note:

- (a) obtained from 1000 envelope runs
- (b) machine length finalized July 2000
- (c) LEBT length only, for simulation
- (d) FES; different codes for different components!
- (e) LBNL: 1e4; LANL: up to 1e6

Note

(a)

(b,c)

(d,e)

