200 MHz Cooling Experiment Design

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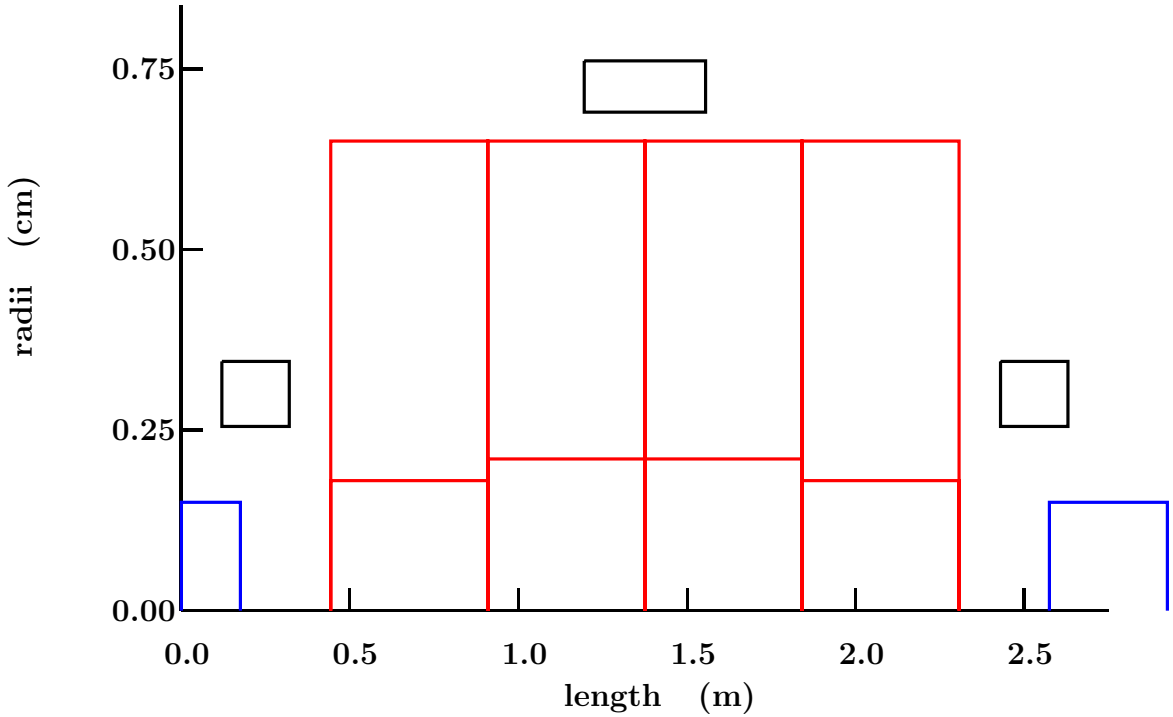
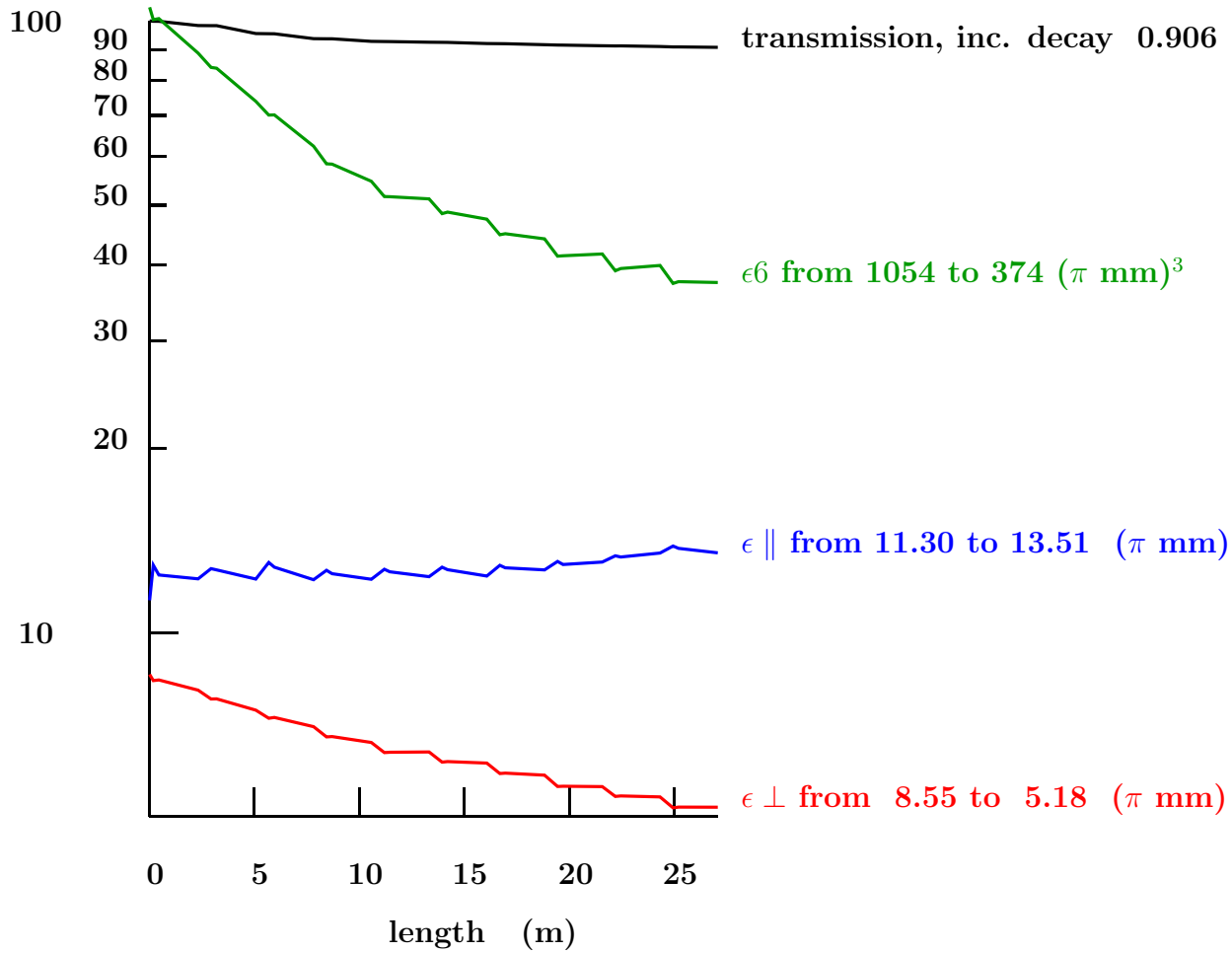
11/20/02 Version 5

cell

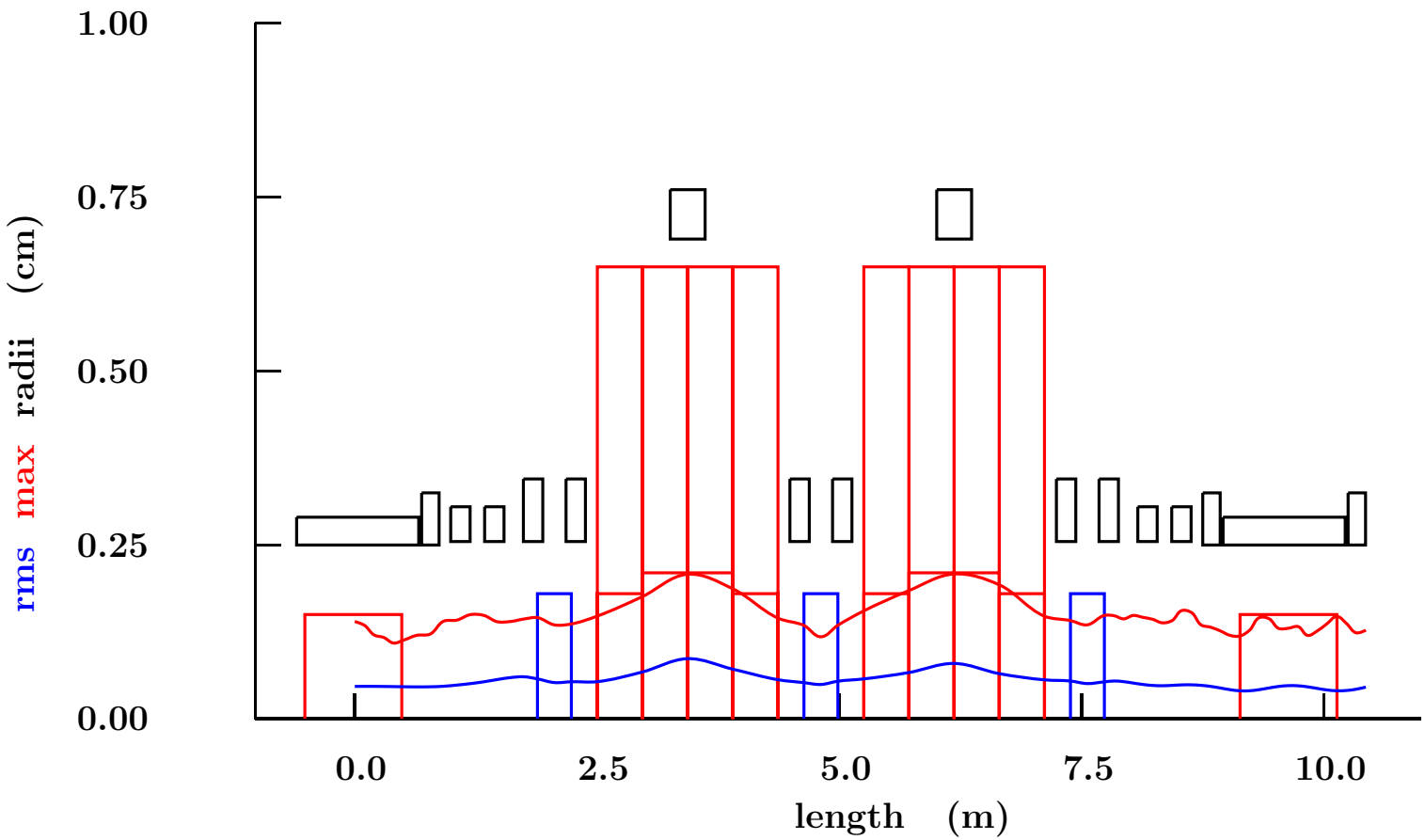
len1 m	gap m	dl m	rad m	dr m	I/A A/mm^2	n I A	n I l A m
0.120	0.120	0.200	0.255	0.090	-105.60	1.90	3.58
1.195	0.875	0.360	0.690	0.071	-104.58	2.67	12.18
2.430	0.875	0.200	0.255	0.090	-105.60	1.90	3.58



Continuous cooling with 10 of these cells

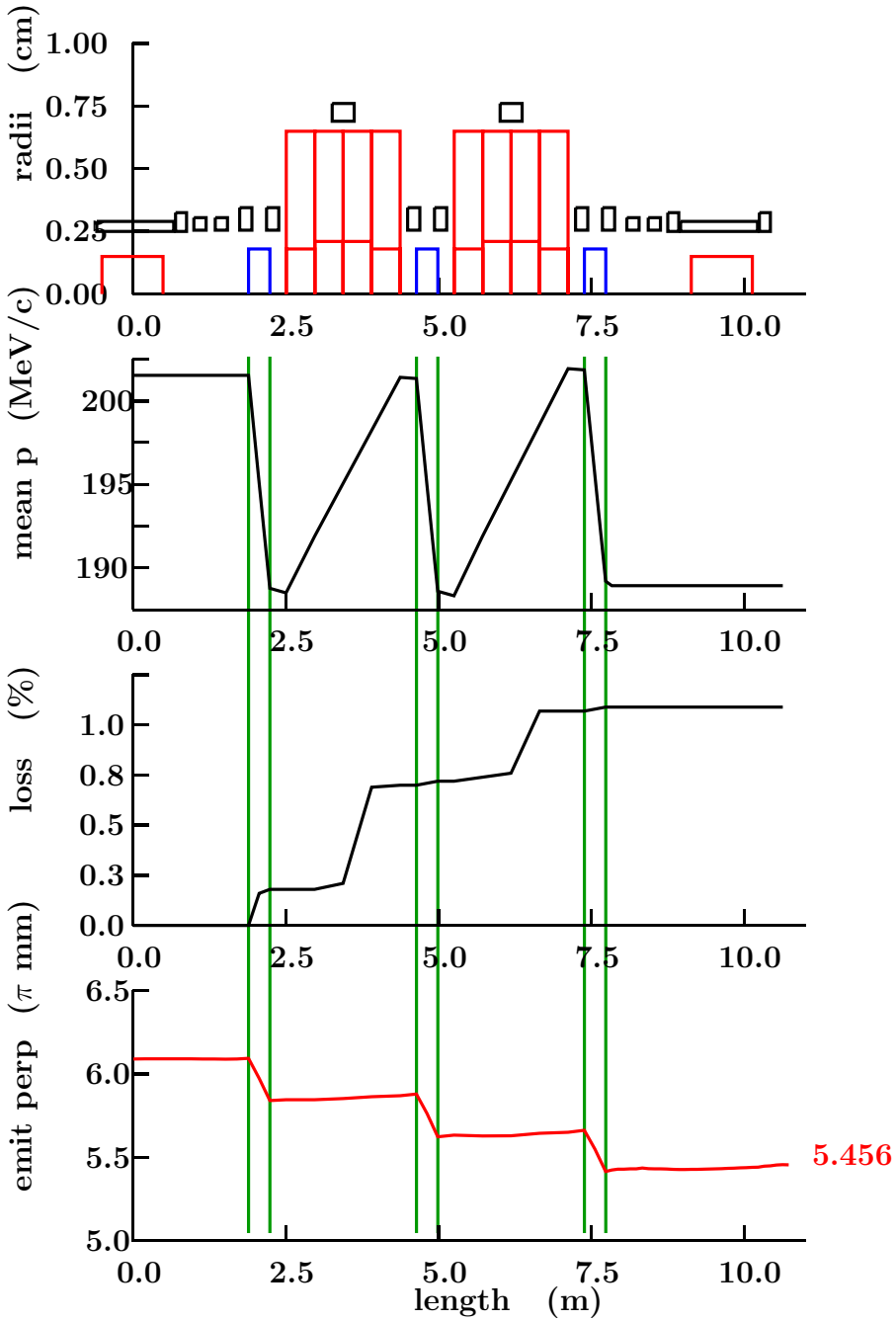


Experiment



Standard Experiment Parameters

	len1 m	gap m	dl m	rad m	dr m	I/A A/mm^2	n I A	n I l A m
end	0.000	0.000	0.180	0.250	0.075	-85.93	1.16	2.10
sol	0.210	0.030	1.260	0.250	0.040	-80.95	4.08	6.92
end	1.500	0.030	0.180	0.250	0.075	-66.67	0.90	1.63
match	1.800	0.120	0.200	0.255	0.050	-99.35	0.99	1.75
match	2.150	0.150	0.200	0.255	0.050	-64.25	0.64	1.13
focus	2.550	0.200	0.200	0.255	0.090	-106.67	1.92	3.62
focus	2.990	0.240	0.200	0.255	0.090	106.67	1.92	3.62
coupling	4.065	0.875	0.360	0.690	0.071	105.63	2.70	12.31
focus	5.300	0.875	0.200	0.255	0.090	106.67	1.92	3.62
focus	5.740	0.240	0.200	0.255	0.090	-106.67	1.92	3.62
coupling	6.815	0.875	0.360	0.690	0.071	-105.63	2.70	12.31
focus	8.050	0.875	0.200	0.255	0.090	-106.67	1.92	3.62
focus	8.490	0.240	0.200	0.255	0.090	106.67	1.92	3.62
match	8.890	0.200	0.200	0.255	0.050	64.25	0.64	1.13
match	9.240	0.150	0.200	0.255	0.050	99.35	0.99	1.75
end	9.560	0.120	0.180	0.250	0.075	66.67	0.90	1.63
solenoid	9.770	0.030	1.260	0.250	0.040	80.95	4.08	6.92
ens	11.060	0.030	0.180	0.250	0.075	85.93	1.16	2.10



- Initial trans emittance = 6.04 (π mm) Gaussian in x, y, px, py
- Initial dp/p = 3 %
- p-amp Correlation = 0.15 GeV/c /radian
- ct-p correlation 1.8 m/(dp/p)
- beta = β_o of Solenoid Field
- Added Angular momentum = p_{angular} for Sol Field

where

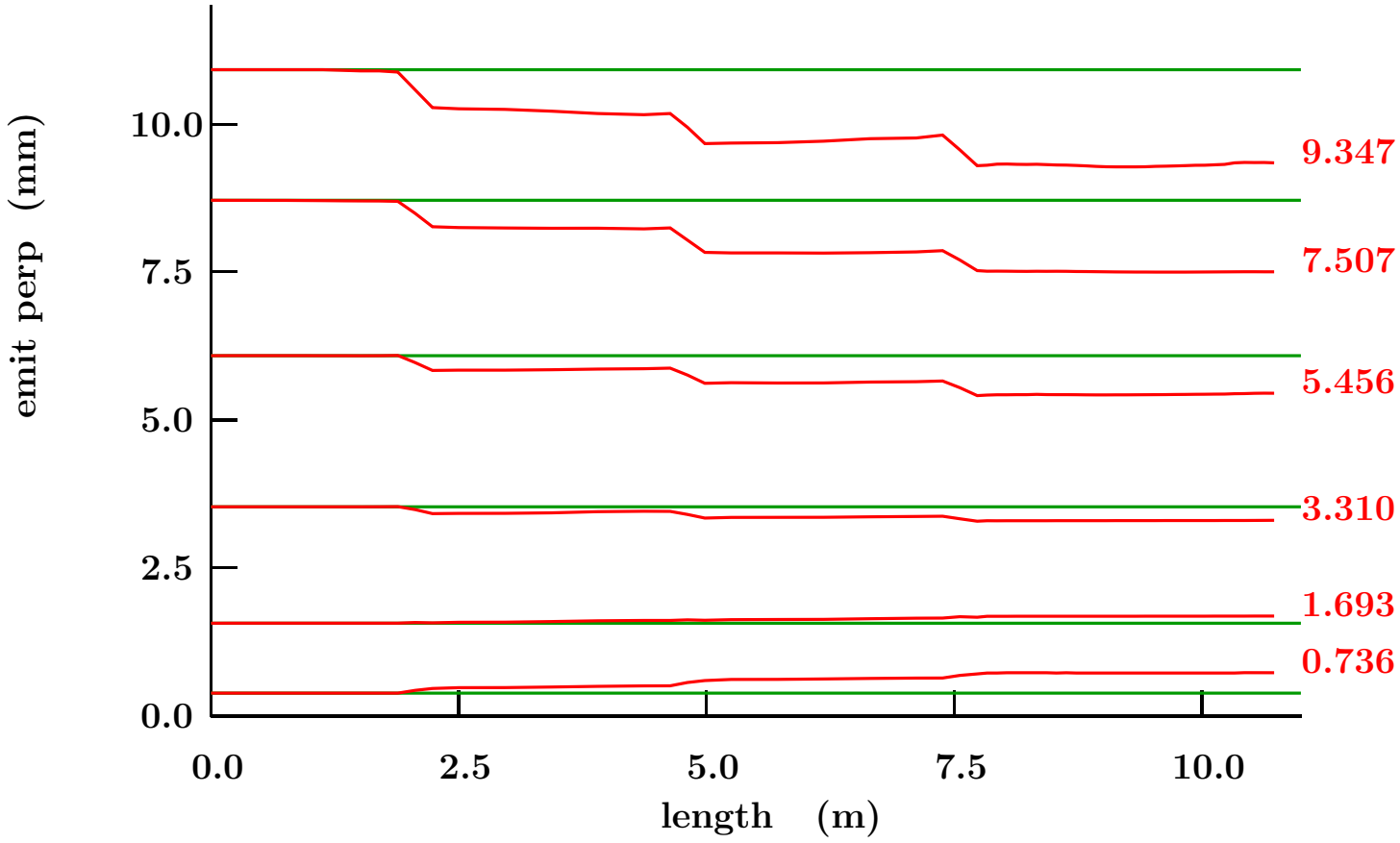
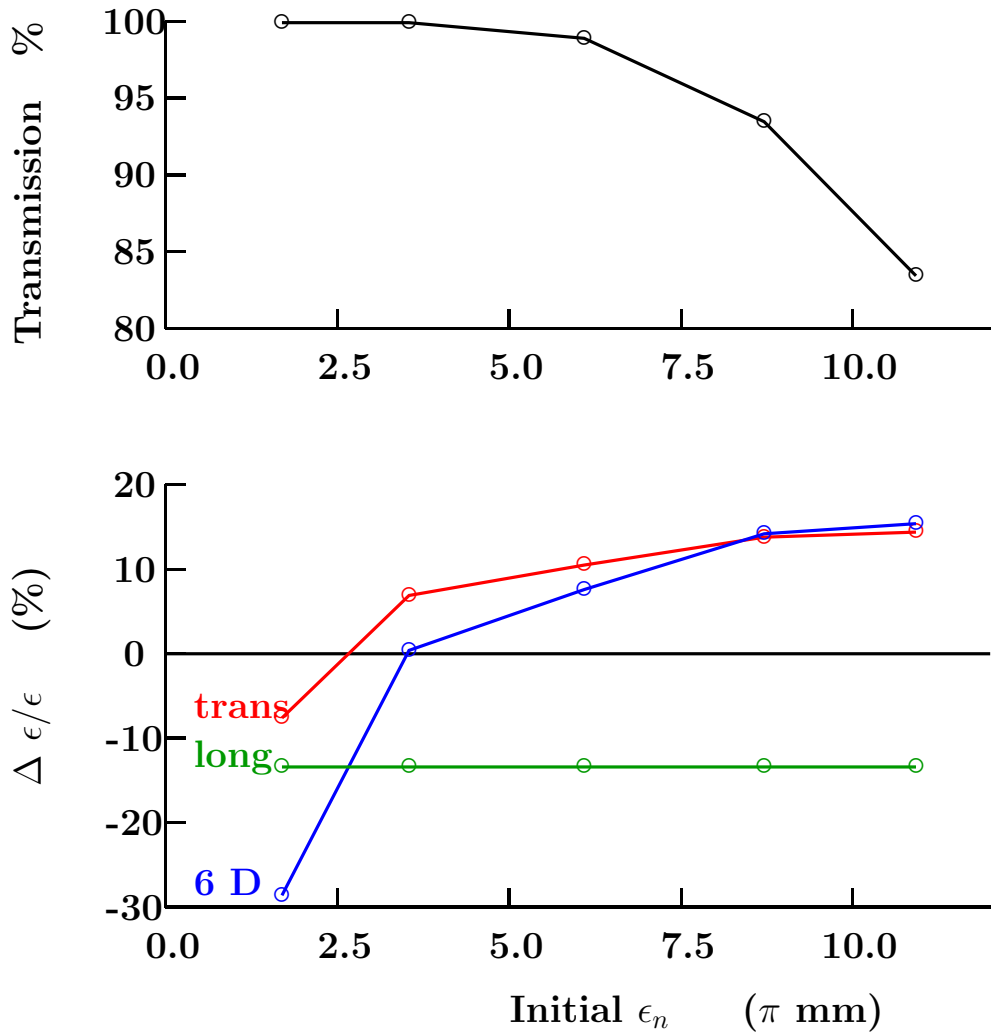
$$A = \left(\left(\frac{p_x}{p_z}\right)^2 + \left(\frac{p_y}{p_z}\right)^2 + \frac{x^2 \ + \ y^2}{\beta^2} \right)$$

$$\beta_o = \frac{2\ p}{B\ c}$$

$$p_{\text{angular}} = \frac{B\ r\ c}{2}$$

p in Volts, c in m/s, B=4 T

As above but starting with different emittances



vs. Initial Emittance