	Radius (mm)	Angle (mrad)		
Initial	1	30		
	.5	15		
	.4	12		
	.3	9		

Run	Runtime (min)	Notes
1	93	3 esqs 3 rf
2	78	4 esq 1 rf
3	132	4 esq 1 rf fixed parameters: esq thickness, beam angle and radius
4	146	4 esq 1 rf, changed to 0.5mm and 15mrad
5	50	4 esqs 0 rf, changed back to nal radius and angle because investigating when same or opposite
6	25	4 single esqs, switched code to single esqs instead of doublets, had to do individually and then add together
7.0	91	10 single esqs, voltages from “7/5 combined first and second” and used 0.4mm and 12mrad
7.0.1	125	Want to rerun with esq4 in right place, also had gap of 1mm and esqs of 1.59mm
7.1	104	used voltages from “6/23”. Changed voltages because they were off, and updated wafer thickness to be 2.59
8.0	125	10 single esqs, voltages from matched at 0.25mm on 7/5, and

		adjusted esq thickness in ESQ def in geometry file
9.0	176	13 esqs, (assuming all are single from now on), trying to match it to newEnvelope3.4, just to see if oscillations and behavior is the same (fingers crossed) 0.4mm 12mrad
10.0	108	10 esqs, trying to match 3.6
10.1	99	0.4mm matching to 3.6
10.2	37	0.3mm matching to 3.7, 1000 particles
10.3	36	Same as 10.2, just with ESQ3 as 150 instead of 250
10.4	36	Same as 10.3, just with ESQ2 as -200 instead of -300
10.5	37	Same as 10.3, ESQ2 -250
10.6	38	Same as 10.2, but with ESQ4 as -250 and ESQ5 as 250
10.7	39	Same as 10.2, but with emit uncommented. Ended up not changing anything
10.7.1	38	Same as 10.7, but with emit doubled
10.7.2	40	Same as 10.7, but with current doubled
11.0	129	From 8.0 but with curr and emit as 10^-12 (since not sure if I can actually modify emit, might just be curr as 10^-12 and emit normal)
11.0.1	133	Same as 11.0 but with both at 10^-100
12.0		From 10.0
13.0		
14.0		From 10.2 testing new geometry test
14.1		From 10.2 testing new geometry test 2
14.2		From 10.2 testing new geo test again
14.3	36	Trying to make plots of conductors in xy plane using og geometry
14.3.1		Trying to make plots of conductors in xy plane, added pfxy in

		the beginning part
14.3.2	35	Added a bunch of other graphs to try to figure out what was going on
15.0	46	Trying with 8mm esqs to see if more similar
16.0		Testing with one esq with voltage 300 and simple parameters for geometry
14.2.3	2	Trying with 10e-9 timestep
14.2.4		Trying with 10e-10 timestep
17.0		Switched to horz and vert ESQs and kept higher voltage
17.1		same as 17.0 but removed middle annulus and normal voltages
17.2		With voltages from newEnv6.1 (but had wrong initial ang and radius)
17.2.1		Make ang 0 and 0.125
17.2.2		Tried with 0.25 radius
18.0.0	3	From 17.2.1 emit 9.45e-7
18.0.1	3	Emit 9.45e-6
18.0.2	3	Emit 9.45e-5
18.0.3	-	Emit 9.45e-4 (didnt work)
18.0.4	-	Emit 9.45e-3 (didnt work)
18.0.5	3	Emit 9.45e-8
18.0.6	4	Emit 9.45e-9
18.0.7	3	Emit commented out (no Emit input)
18.1.0	3	Added pzepsx plot. Emit commented out
18.1.1	3	Added pzepsnx plots
18.1.2	3	Added pzepsny, pzepsnz plots. Seems to show emit at end. X and y are not the same emit
18.2.0	1	Cut total length and time in half, bc wanted to see if emit for x

		and y was the same as in the last one
18.2.1	<1	Cut time and length in 10, saw emit for x and y at beginning normalized both x and y are ~6e-6. Unnormalized is 9e-9
18.3.0	<1	Changed inputs from .125mm 0mrad to 0.3mm 9mrad to see effect on emittance. It increased from 9e-9 to 12e-9
18.3.1	<1	Changed inputs to 1mm 30mrad to see effect on emittance. It increased to 480e-9
19.0.0	1	From 18.1.2 Trying to replicate newEnvelope7.0.1 0.125mm and 4/-4 mrad and 7keV (Was totally different again. Then tried to make python be like warp. Changing emittance and initial radii did not get it any closer, but increasing the physical aperture to 1.5*0.55mm did make it look pretty close)
19.0.1	2	With geometry_test8 changing metal_width from 0.1 to 0.05 (didnt see any difference)
19.0.2	2	Changed metal_width to 0.01mm
19.0.3	2	Changed metal_width to 0.2 (doubled original)
19.0.4	2	Changed metal_width to 0.5mm
19.0.5	11?	Same as 19.0.4 but with shorter timestep, hopefully, to see the geometry. Yes saw very thick metal as expected, and saw red and green on electrodes
19.1.0	4	From 18.1.2 0.3mm 9mrad: All 0 esqs, and added in 10. Back to using 0.1mm metal_width and 1e-9 timescale
19.1.1	3	Same but 9 -9 mrad
19.2.0	8	Switched to cb with cp input --cb 1 (after normal py input)
19.0.0.1	4	Running with --cb 1… weird ..?
19.3.0	3	Added Y to particle and field plot. From 19.1.0
19.3.1	3	Added Y to particle and field plot. From 19.0.0
19.4.0	1	Added Beam edge for X and Y with wp.hpenvx and hpenvy

		But dont need title, run again without extra title
19.4.1	1	Same just without extra title. But want to see if can get on same graph
19.4.2	1	Trying to put on same graph>> success
19.4.3	**1**	**Adding better title and color**
19.5.0	-	Testing with datafile = open("datafile.txt", 'r') >> didnt work
19.6.0	-	Testing wp.asciipart() to hopefully: write the particles data from a species to a text file. First didnt work because needed a species for s Then tried s=”Ar” but that didnt work either, failed later said needed Species Tried s=-1 because that is supposed to: -1 means use data combined from all species. Tried (s=-1,Species=-1) because still giving error with Species Tried with (s=’all’) > name 'Species' is not defined Tried (s='all',Species=0)
19.6.1	3	Got it to export text file but it was not what I wanted. Was only at the end and contained very random points
19.7.0	1	From 19.4.3 Trying just one ESQ to compare (to newEnv8.0.0)
19.7.1	4	Same, smaller timestep for more accuracy. The two match to each other nicely
19.8.0	5	Adding second ESQ at 300V, -300V
19.8.1	9	2 ESQs 150V, -250V
19.8.2	10	3 ESQs 150V, -250V, 250V
19.8.3	14	4 ESQs [150,-250,250,-500]
19.8.4	28	6 ESQs [150,-250,250,-500,500,500]
19.8.5	73	13 ESQs[100,-250,250,-160,120,-110,95,-75,60,-50,40,-30,20]
19.9.0		4 ESQs [-75,90,-90,90] .25mm and 5/-5mrad
19.9.1		75,-90,90,-150

19.9.2		[75,-90,90,-200,200] .25 5mrad
19.9.3		75,-90,90,-150 .125 5mrad
		Need to test with different radii and angle s to see emit change and
20.0	1	1mm 30mrad [0,0,0,0]
20.1	1	Commented out vbeam=0
20.2	1	Changed to 0.3mm
20.3	1	Changed particle plot to be twice as big [50,-100,100,-100]
20.4	1	Changed zc_start_position = 0.01 instead of 0.1 > didnt seem to change, switch back
20.5	1	wp.top.inject = 2 # 2 means space-charge limited injection Changed to 2 instead of 1 >> turns out def not what i want, switched back to 1 Frame, vx and vy plot let the original titles show>> this seems better, shows mean velocity
20.6	3	Turned on cb>> didnt seem like what i wanted, changed back
20.7	-	Changed zc crossing to 0.015 from 0> got weird error, changed back
20.8	1	Changed plotsteps to 40 from 20> just showed half as often
20.9	1	Changed plotsteps to 10 wp.top.linj_efromgrid change to false>> didnt notice any difference, changed back
20.10	1	Tested with dirichlet instead of neumann BCs>> looks much nicer on Ex plots, and doesnt seem to make a diffeernce on the envelope so kept it
20.11	1	Changed prwall from 1mm to 0.5mm>> cut at 0.5 as expected
20.12	1	Changed prwall to 0.55mm Changed grid size to 2mm and width to 20mm >> seems good, keep changes
20.13	1	Changed max particles to 8000 instead of 1000 and 200 per step instead of 250>> only slightly different, but keep b/c seems

		little more accurate
20.14	1	wp.top.rinject = 5000 # emitting surface curvature Uncommented this for test>> coudlnt see any difference, so recommended it out
20.15	1	Wp.top.linj_eperp changed from false to true>> Didnt notice any difference, turn back to false
20.16		Changed wp.top.vinject from 1 to Vmax >> Didnt notice any difference, turn back to 1
20.17	2	Changed grid spacing from 30 to 60: the number of mesh elements in one window>> more accurate/higher resolution but took longer>> change back to 30 for now, can increase again if necessary
20.18	1	Changed wp.w3d.nz to 100.0 instead of 180
20.19	2	Changed submesh, added +d_wafer from original >> seems about the same
20.20		.25mm 5/-5mrad emit =200e-8 [75,-100,125,-150]
20.21		.25mm 5/-5mrad emit =0.63e-6 [75,-100,125,-150]
20.22		[100,-250,250,-160,120,-110,80,-26,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,-30,60,-45,40,-40,30,-30,30]