

Appendix E

Summary of Data from Performance Studies

Table E.1. Summary of performance data using initial motor.

Summary of Results Using Initial Motor								
Configuration	Trial	System Current (amps)	System Voltage (V)	RPM	Sub Velocity U_v (cm/s)	σ_{Uv} (cm/s)	Jet Velocity, U_{avg} (cm/s)	σ_{Uavg} (cm/s)
Steady w/out shell	1	9.89	36.61	2421	11.76	2.53	151.36	29.90
	2	12.75	36.21	2787	18.13	3.24	162.77	32.01
	3	12.33	36.24	2777	24.71	3.79	157.84	31.31
	4	11.80	36.27	2778	21.83	2.63	157.76	32.11
	5	11.96	36.13	2732	26.40	2.87	154.18	30.83
	6	9.90	35.58	2357	13.99	2.81	140.80	27.24
	7	14.01	34.69	2966	24.17	3.07	163.31	32.98
	8	13.33	34.58	2947	27.28	2.69	158.11	32.81
	9	13.73	34.39	2920	27.16	3.64	158.39	31.15
	10	13.48	34.21	2913	29.50	2.94	153.91	33.45
	11	12.07	34.46	2648	22.45	2.53	151.79	31.86
	12	12.04	34.41	2573	15.05	2.98	158.45	29.37
	13	11.34	34.38	2626	15.15	3.18	155.16	28.50
	14	11.67	34.38	2610	19.14	2.88	153.08	30.44
	15	12.29	35.99	2719	23.85	3.31	153.56	30.54
	16	12.84	36.15	2775	23.24	4.02	162.09	28.11
Steady w/ shell	1	13.60	35.80	2587	12.81	2.78	130.33	27.48
	2	14.18	35.73	2576	8.48	2.52	137.79	24.88
	3	16.44	34.00	2700	20.14	3.10	134.54	26.96
	4	16.39	33.96	2753	14.66	3.76	138.28	28.91
	5	16.37	33.86	2760	19.56	1.80	139.87	25.71
	6	15.86	33.77	2766	15.46	4.11	139.05	25.62
	7	18.22	33.02	2916	21.29	2.65	143.27	29.21
	8	18.13	32.80	2896	22.58	4.51	145.95	27.09
	9	17.98	32.69	2868	25.54	1.83	145.54	26.14
	10	18.20	32.65	2879	23.76	2.55	136.55	28.67
	11	13.71	35.95	2614	14.37	3.13	136.88	27.34
	12	13.85	36.01	2614	8.92	2.45	138.01	26.20
	13	16.00	35.53	2847	17.11	2.29	155.96	24.61
	14	15.85	35.38	2833	22.27	2.58	139.69	25.86
	15	15.48	35.30	2807	21.83	2.31	141.79	27.01
	16	15.54	35.19	2811	21.35	2.91	142.74	27.20
Pulsed	1	14.34	35.72	2559	22.65	2.82	148.04	24.70
	2	13.72	35.64	2580	18.75	3.75	147.82	27.62
	3	14.81	35.32	2543	19.48	4.05	147.79	28.21
	4	13.92	35.63	2556	21.72	4.06	145.95	27.01
	5	13.71	35.72	2609	21.41	2.53	148.02	28.47
	6	13.51	35.56	2605	19.62	3.83	148.43	28.06
	7	17.02	35.05	2820	34.26	4.34	155.01	29.33
	8	16.38	34.91	2813	32.28	3.41	151.41	28.34
	9	13.71	35.72	2609	21.41	4.13	160.39	27.86
	10	18.05	33.14	2887	32.93	4.57	154.35	28.84
	11	19.44	32.97	2959	36.48	5.10	153.26	28.46
	12	18.67	33.07	2913	37.36	2.91	150.91	28.11
	13	18.46	33.01	2906	30.74	2.64	143.03	28.84
	14	16.43	35.86	2887	35.76	3.63	146.45	29.51
	15	17.36	35.87	2867	35.20	2.95	150.33	28.01

Table E.2. Summary of performance data using second motor.

Summary of Results Using Second Motor														
Configuration	Trial	Motor Current (amps)	Motor Voltage (V)	σ _{Motor Current} (amps)	σ _{Motor Voltage} (V)	System Current (amps)	σ _{System Current} (amps)	System Voltage (V)	RPM	Sub Velocity U _v (cm/s)	σ _{U_v} (cm/s)	Jet Velocity, U _{avg} (cm/s)	σ _{U_{avg}} (cm/s)	
Steady w/out shell	1	7.92	0.295	28.60	0.458	8.71	0.337	39.0	3152	33.1	24.16	5.28	162.13	39.11
	2	9.14	0.510	30.75	0.289	10.04	0.225	39.0	3400	29.6	33.88	4.56	169.56	41.94
	3	9.00	0.506	30.74	0.387	10.04	0.200	39.0	3240	17.5	33.22	3.55	164.23	42.95
	4	9.07	0.513	31.02	0.182	10.07	0.257	39.0	3343	13.4	34.13	3.45	165.26	40.90
	5	9.27	0.555	30.77	0.234	10.26	0.253	39.0	3381	24.4	35.81	4.69	172.92	41.39
	6	11.15	0.451	33.64	0.107	12.26	0.203	39.0	3710	30.4	41.48	5.78	181.01	46.84
	7	11.03	0.525	33.47	0.228	12.15	0.279	39.0	3756	34.2	43.25	5.95	177.74	44.88
	8	11.11	0.510	33.56	0.170	12.34	0.194	39.0	3716	39.2	43.90	6.13	180.26	45.61
	9	11.40	0.513	34.49	0.164	12.35	0.062	40.0	3830	25.8	40.11	5.50	178.11	48.50
	10	11.40	0.514	34.19	1.243	12.32	0.817	40.0	3783	29.0	43.99	4.84	173.11	51.69
	11	6.78	0.287	26.19	0.586	7.52	0.355	39.0	2896	27.2	16.71	6.13	154.22	38.00
	12	7.82	0.339	28.21	0.510	8.67	0.322	39.0	3157	35.9	25.56	6.13	157.39	38.00
Pulsed	1	11.01	0.492	29.89	0.373	12.15	0.164	39.0	3252	26.8	33.76	5.16	157.44	32.12
	2	13.16	1.236	32.58	0.151	14.81	0.1359	39.0	3508	19.5	39.58	4.81	164.93	41.94
	3	11.04	0.489	29.91	0.321	12.30	0.1998	39.0	3228	30.5	33.53	5.30	156.93	42.95
	4	13.95	0.272	33.16	0.072	15.59	0.1607	39.0	3535	23.9	44.67	5.22	169.50	40.90
	5	14.42	0.282	34.04	0.078	16.04	0.1481	40.0	3617	24.2	44.07	5.84	173.68	41.39
	6	14.32	0.362	34.02	0.077	15.97	0.2743	40.0	3627	21.3	47.02	4.58	170.40	46.84
	7	14.82	0.313	34.85	0.200	16.47	0.4173	41.0	3654	82.5	51.09	4.94	167.10	45.06
	8	15.42	0.314	35.65	0.099	17.10	0.0823	42.0	3748	38.3	53.58	2.88	176.63	36.67
	9	15.25	0.296	35.82	0.057	17.03	0.1705	42.0	3767	20.2	55.08	3.64	175.03	37.43
	10	7.70	0.380	24.91	0.733	8.42	0.3480	39.0	2745	29.3	13.87	5.04	141.90	30.00
	11	9.19	0.429	27.48	0.560	9.80	0.3620	39.0	2972	28.3	22.33	4.77	148.60	30.00
	12	11.47	0.754	30.24	0.430	12.55	0.3380	39.0	3200	29.1	32.77	5.11	157.74	32.00