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Study of the Bed Velocity Induced by Twin Propellers

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Supplemental Data

Table S1: Velocity Component Measurements at Each Point

X (cm)	Y (cm)	Z (cm)	Vx (cm/s)	Vy (cm/s)	Vz (cm/s)
63.5	0	16.75	31.69	1.36	-5.53
63.5	-15	16.43	29.15	5.23	-5.42
63.5	-30	16.56	47.78	-1.71	-0.06
63.5	-45.5	16.48	20.69	5.77	2.87
63.5	-61	16.93	-0.78	13.62	1.44
63.5	-76.5	16.91	-5.44	16.26	0.77
127	0	17.46	46.08	0.04	-4.2
127	-15	17.3	41.03	-3.07	-4.84
127	-30	17.43	32.4	-1.84	-4.38
127	-45.5	17.49	22.63	-0.18	-2.26
127	-61	17.84	11.48	1.62	-0.73
127	-76.5	17.86	2.7	4.26	0.22
190.5	0	17.91	38.12	0.41	-2.42
190.5	-15	17.8	35.47	-3.64	-2.24
190.5	-30	18.05	29.47	-3.86	-1.98
190.5	-45.5	18.2	23.75	-4.19	-1.46
190.5	-61	18.57	16.19	-5.54	-1.51
190.5	-76.5	18.79	8.6	-5.41	-0.86
254	0	18.19	30.44	-0.63	-0.29
254	-15	18.01	28.47	-4	-0.59
254	-30	18.09	24.86	-4.99	-1
254	-45.5	18.4	20.87	-6.25	-1.05
254	-61	18.83	15.57	-8.48	-1.2
254	-76.5	18.79	10.34	-9.62	-1.16
381	0	18.84	12.44	-2.76	0.42

SUPPLEMENTAL DATA

381	-15	18.7	11.81	-4.57	0.06
381	-30	18.91	11.07	-5.3	0.09
381	-45.5	19	9.66	-5.83	-0.22
381	-61	19.29	7.63	-7.22	-0.25
381	-76.5	19.44	5.83	-8.18	-0.18
381	0	8.92	15.71	-4.32	-0.43
381	-15	8.71	14.74	-6.58	-0.63
381	-30	8.96	14.16	-7.59	-0.67
381	-45.5	8.96	12.46	-8.55	-0.44
381	-61	9.29	10.5	-10.4	-0.67
381	-76.5	9.22	7.79	-11.48	-0.78
254	0	8.23	39.86	-0.7	-1.21
254	-15	8.01	36.76	-5.61	-1.27
254	-30	8.15	31.51	-7.22	-1.36
254	-45.5	8.06	26.22	-8.9	-1.37
254	-61	8.67	20.2	-12.16	-1.74
254	-76.5	8.67	13.9	-13.61	-1.9
190.5	0	7.93	51.56	-1.5	-2.09
190.5	-15	7.79	46.41	-7.69	-2.12
190.5	-30	8.02	38.15	-9	-2.36
190.5	-45.5	8.16	29.72	-10.02	-2.4
190.5	-61	8.57	21.07	-12.17	-2.5
190.5	-76.5	8.76	12.74	-11.69	-1.76
127	0	7.59	64.36	-2.82	-5.02
127	-15	7.3	56.1	-10.29	-3.73
127	-30	7.35	41.06	-10.11	-3.29
127	-45.5	7.49	27.6	-8.68	-2.16
127	-61	7.68	15.87	-7.02	-1.66
127	-76.5	7.84	6.1	-3.76	-0.52
63.5	0	6.77	32.47	-0.05	-10.52
63.5	-15	6.29	29.49	-1.47	-6.34
63.5	-30	6.39	31.9	-6.92	-4.88
63.5	-45.5	6.47	15.74	-1.24	-0.53
63.5	-61	6.94	0.7	7	0.83
63.5	-76.5	6.88	-6.49	12.34	1.11
63.5	76.5	7.09	-4.57	-9.17	0.43
63.5	61.5	6.72	5.4	-3.35	0.35

SUPPLEMENTAL DATA

63.5	46.5	6.74	23.12	6.02	-1.54
63.5	31	6.62	35.22	9.24	-5.55
63.5	15.5	6.85	32.05	-1.41	-7.19
63.5	0	6.65	33.46	-1.96	-9.39
127	76.5	7.59	13.22	5.26	-0.35
127	61.5	7.32	26.54	8.6	-0.92
127	46.5	7.29	39.24	11.48	-2.36
127	31	7.2	54.82	12.38	-2.89
127	15.5	7.42	66.78	4.5	-5.24
127	0	7.45	69.7	-4.23	-6.6
190.5	76.5	7.8	22.35	15.09	-1.92
190.5	61.5	7.37	33.07	13.36	-1.88
190.5	46.5	7.59	40.95	12.09	-1.95
190.5	31	7.65	50.92	10.05	-1.62
190.5	15.5	8.02	58.24	2.27	-2.23
190.5	0	7.7	60.47	-5.22	-3.25
254	76.5	8.02	23.43	13.97	-1.73
254	61.5	7.54	29.85	10.66	-1.56
254	46.5	7.61	33.75	8.72	-1.34
254	31	7.67	38.58	6.15	-0.86
254	15.5	8.19	41.67	0.24	-1.26
254	0	8.05	42.61	-5.04	-1.48
381	76.5	8.85	14.66	6.64	-0.21
381	61.5	8.29	16.26	5.05	-0.26
381	46.5	8.48	16.26	4.04	-0.28
381	31	8.48	17.03	2.91	-0.35
381	15.5	8.79	16.9	0.34	-0.27
381	0	8.71	16.16	-1.47	-0.43
381	76.5	18.67	11.57	4.59	0.07
381	61.5	18.24	13.44	3.15	0.19
381	46.5	18.57	13.37	2.3	0.21
381	31	18.42	13.55	1.45	0.19
381	15.5	18.7	13.43	-0.32	-0.01
381	0	18.72	12.74	-1.94	-0.03
254	76.5	17.8	19.07	10.08	-1.56
254	61.5	17.47	24.46	7.55	-1.81
254	46.5	17.69	27.66	6.05	-1.56

SUPPLEMENTAL DATA

254	31	17.53	31.69	4.23	-0.99
254	15.5	18	33.24	-0.2	-1.13
254	0	17.89	33.26	-3.72	-1.13
190.5	76.5	17.81	17.31	6.67	-1.33
190.5	61.5	17.3	25.6	6.3	-2.18
190.5	46.5	17.43	31	6.48	-2.83
190.5	31	17.58	36.11	5.78	-2.68
190.5	15.5	17.9	38.65	1.62	-2.65
190.5	0	17.67	39.69	-2.41	-2.08
127	76.5	17.53	7.36	-1.98	-0.81
127	61.5	17.16	19.09	0.46	-1.33
127	46.5	17.11	31.89	3.44	-3
127	31	17.2	42.26	4.73	-4.75
127	15.5	17.37	48	0.75	-4.53
127	0	17.35	47.98	-2.14	-3.97
63.5	76.5	16.95	-8.13	-16.14	-0.33
63.5	61.5	16.55	-0.98	-12.93	0.62
63.5	46.5	16.65	27.81	-2.77	2.8
63.5	31	16.54	53.26	5.38	-1.71
63.5	15.5	16.75	32.71	-2.8	-6.77
63.5	0	16.64	34.34	0.52	-5.68
63.5	76.5	27.65	-10.27	-18.2	-0.72
63.5	61.5	27.26	-4.68	-15.68	1.64
63.5	46.5	27.24	19.02	-10.23	6.86
63.5	31	27.28	49.37	-7.85	3.79
63.5	15.5	27.49	57.08	0.34	-5.27
63.5	0	27.47	62.34	-3.49	-6.3
127	76.5	27.65	1.61	-5.64	-0.56
127	61.5	27.26	12.84	-2.52	-0.66
127	46.5	27.24	26.08	1.44	-1.91
127	31	27.28	34.98	3.63	-2.82
127	15.5	27.49	40.41	0.85	-2.15
127	0	27.47	40.29	-2.13	-2.05
190.5	76.5	27.85	11.32	4.39	-1.01
190.5	61.5	27.41	17.82	4.18	-1.75
190.5	46.5	27.66	21.24	4.11	-2.11
190.5	31	27.71	24.2	3.69	-2.28

SUPPLEMENTAL DATA

190.5	15.5	28.02	26.25	1.47	-2.04
190.5	0	27.81	27.11	-0.63	-1.71
254	76.5	27.88	11.57	6.18	-1.02
254	61.5	27.51	15.2	5.01	-1.14
254	46.5	27.71	16.85	4.37	-1.37
254	31	27.66	18.31	3.14	-1.08
254	15.5	28.05	19.85	0.51	-1.01
254	0	28.01	20.44	-1.63	-0.67
381	76.5	28.79	6.07	1.8	0.12
381	61.5	28.29	8.07	0.52	0.36
381	46.5	28.51	9.1	-0.58	0.44
381	31	28.41	9.96	-1.17	1.03
381	15.5	28.73	10.14	-2.81	0.66
381	0	28.78	9.3	-4.02	0.22
381	76.5	38.67	3.95	1.61	-0.16
381	61.5	38.24	4.95	0.63	-0.26
381	46.5	38.57	5.22	-0.16	0.04
381	31	38.42	5.66	-1.05	0.19
381	15.5	38.7	5.89	-2.37	0.45
381	0	38.72	5.63	-3.6	0.24
254	76.5	37.8	9.09	6.13	-0.67
254	61.5	37.47	11.8	4.74	-0.59
254	46.5	37.69	13.4	4.33	-0.86
254	31	37.53	15.17	3.45	-0.81
254	15.5	38	15.75	1.08	-0.96
254	0	37.89	15.46	-0.74	-0.95
190.5	76.5	37.81	11.7	4.05	-0.34
190.5	61.5	37.3	17.33	3.27	-0.75
190.5	46.5	37.43	20.42	3.23	-0.7
190.5	31	37.58	22.36	2.73	-0.67
190.5	15.5	37.9	22.64	0.9	-1.06
190.5	0	37.67	22.01	-0.38	-1.03
127	76.5	37.53	2.93	-2.41	0.35
127	61.5	37.16	13.09	-0.3	1.08
127	46.5	37.11	23.28	1.66	1.45
127	31	37.2	30.05	3.49	1.85
127	15.5	37.37	32.99	1.59	2.47

SUPPLEMENTAL DATA

127	0	37.35	34.36	-1.47	2.8
63.5	76.5	36.95	-8.63	-13.2	-1.54
63.5	61.5	36.55	-7.19	-12.56	-0.03
63.5	46.5	36.65	-0.19	-11.08	4.25
63.5	31	36.54	11.66	-7.95	9.37
63.5	15.5	36.75	20.45	-3.47	7.16
63.5	0	36.64	24.28	-1.1	4.98
63.5	0	36.94	25.88	-0.66	5.61
63.5	-15	36.65	22.1	0.53	10.08
63.5	-30	36.81	13.29	7.51	11.07
63.5	-45.5	36.48	3.93	10.37	5.47
63.5	-61	36.71	-1.26	11.73	0.27
63.5	-76.5	36.63	-2.47	12.65	-1.34
127	0	47.65	33.62	-0.37	3.42
127	-15	47.26	30.11	-3.01	2.27
127	-30	47.24	24.54	-1.3	1.13
127	-45.5	47.28	17.89	0.65	1.18
127	-61	47.49	8.8	1.63	0.57
127	-76.5	47.47	0.79	4.17	0.22
190.5	0	47.85	21.36	1.43	-0.95
190.5	-15	47.41	20.53	-0.39	-0.87
190.5	-30	47.66	18.89	-0.78	-0.9
190.5	-45.5	47.71	16.04	-1.42	-0.6
190.5	-61	48.02	11.32	-2.79	-0.73
190.5	-76.5	47.81	5.1	-2.87	-0.33
254	0	47.88	16.35	0.62	-1.06
254	-15	47.51	16.47	-1.51	-1.13
254	-30	47.71	15.07	-2.63	-1.15
254	-45.5	47.66	12.36	-3.59	-0.82
254	-61	48.05	8.87	-5.41	-1.03
254	-76.5	48.01	4.84	-6.32	-1.04
381	0	48.79	5.7	-4.16	-0.24
381	-15	48.29	4.83	-5.22	-0.3
381	-30	48.51	4.01	-5.77	-0.31
381	-45.5	48.41	2.93	-6.38	-0.32
381	-61	48.73	1.54	-6.94	-0.23
381	-76.5	48.78	0.11	-7.48	-0.31

SUPPLEMENTAL DATA

381	0	28.62	10.49	-3.57	0.01
381	-15	28.42	9.98	-5.03	0
381	-30	28.96	9.01	-5.78	0.04
381	-45.5	28.69	7.51	-6.45	0.23
381	-61	29.03	5.51	-7.27	0.04
381	-76.5	29.08	3.66	-7.85	-0.05
254	0	27.8	21.95	0.71	-1.17
254	-15	27.75	21.58	-2.13	-0.76
254	-30	27.87	18.81	-3.12	-0.92
254	-45.5	28.08	15.46	-4.32	-1.05