

Measurements of sediment pickup rate over dune-covered bed

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Environmental Fluid Mechanics

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D1-0.23-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
1	D1-0.23-1	0.050	0.234	0.00023	2.38	8.78E-03	0.407	2.07E-03	8.26E-06

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	-1.297	0.659	-1.149	6.408	7.098	3.253	8.406
0.9	2.442	0.894	-1.581	7.385	7.267	3.920	14.113
1.4	6.330	0.422	-2.180	8.364	7.482	4.392	20.380
1.9	12.627	0.073	-2.926	9.171	8.373	4.625	23.787
2.4	18.782	-0.161	-3.264	8.888	6.932	4.156	20.508
2.9	23.982	-0.070	-3.368	8.936	6.145	4.025	21.435
3.4	30.335	-0.241	-3.622	7.167	4.961	3.223	11.888
3.9	34.146	-0.084	-3.461	5.688	4.127	2.584	6.030
4.4	36.263	-0.427	-3.039	5.115	3.905	2.494	4.971
5.4	38.667	-0.241	-2.547	4.463	3.594	2.292	3.610
6.4	39.950	-0.292	-2.277	4.587	3.433	2.296	4.140
7.4	41.804	-0.392	-2.089	4.298	3.396	2.334	3.710
8.4	41.649	-0.404	-1.370	4.442	3.420	2.297	3.732
9.9	43.228	-0.281	-0.725	4.232	3.264	2.326	3.318
11.4	45.959	-0.212	-1.436	3.918	2.937	2.300	3.645
12.9	47.370	-0.307	-1.492	3.314	2.716	2.115	1.780
14.4	48.008	-0.180	-1.600	2.882	2.564	1.860	0.396

Notation

D	Sediment diameter (m)	U	Depth-averaged u (m/s)
E	Sediment pickup rate (m/s)	z	Vertical distance from the bed
H	Flow depth (m)	τ_{max}	Maximum Reynolds shear stress $-\overline{\rho u'w'}$
k_{max}	Maximum turbulence kinetic energy (m ² s ⁻²)		
K	Depth-averaged k (m ² s ⁻²)		
Q	Flow discharge (m ³ s ⁻¹)		
u, v, w	Time-averaged mean flow velocity in streamwise, spanwise and vertical directions		
u', v', w'	Root mean square of velocity fluctuations		

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D1-0.23-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
2	D1-0.23-2	0.050	0.226	0.00023	1.86	7.09E-03	0.416	1.91E-03	7.25E-06

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	16.587	0.732	0.222	7.374	7.311	3.702	10.736
1	19.230	0.377	-0.283	7.859	7.862	4.259	16.087
1.5	22.283	0.313	-0.949	8.192	7.128	4.232	17.826
2	24.916	0.244	-0.982	8.477	6.366	3.988	18.599
2.5	29.203	0.012	-1.317	7.722	5.980	3.624	13.100
3	31.837	-0.022	-1.358	6.832	5.231	3.213	10.924
3.5	34.289	0.003	-1.351	5.669	4.344	2.771	5.614
4	36.205	-0.048	-1.184	5.124	3.958	2.593	4.899
4.5	36.422	-0.151	-0.922	4.922	3.748	2.508	4.720
5.5	38.888	-0.212	-0.854	4.620	3.545	2.458	4.283
6.5	40.204	-0.203	-0.829	4.346	3.522	2.362	4.062
7.5	41.694	-0.077	-0.797	4.378	3.367	2.358	4.292
8.5	41.962	-0.174	-0.126	4.425	3.322	2.216	3.664
10	44.919	-0.103	-0.622	4.004	3.041	2.266	3.139
11.5	46.071	-0.180	-0.912	3.449	2.774	2.176	2.001
13	46.986	-0.211	-1.069	3.023	2.633	2.000	1.021
14.5	46.722	-0.234	-0.995	2.760	2.681	1.891	-0.163
16	46.315	-0.314	-0.930	2.668	2.688	1.682	-0.987

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D1-0.23-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
3	D1-0.23-3	0.050	0.218	0.00023	1.23	4.42E-03	0.408	1.73E-03	8.45E-06

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	24.933	-0.351	0.975	6.073	6.056	3.095	7.032
1.3	26.773	-0.138	0.728	6.592	5.716	3.300	9.325
1.8	28.327	0.009	0.513	6.743	5.460	3.629	12.334
2.3	29.799	0.019	0.346	6.627	5.502	3.492	11.457
2.8	32.304	-0.273	0.202	6.502	4.713	3.148	10.097
3.3	34.625	-0.265	-0.153	5.893	4.372	2.827	6.818
3.8	36.814	-0.170	-0.195	5.071	3.829	2.478	4.593
4.3	37.718	-0.172	-0.180	4.723	3.685	2.346	3.978
4.8	38.636	-0.137	0.075	4.483	3.506	2.280	3.777
5.8	40.429	-0.365	-0.053	4.305	3.278	2.216	3.190
6.8	40.902	-0.271	0.095	4.259	3.270	2.181	3.185
7.8	41.910	-0.182	0.323	4.013	3.173	2.156	2.637
9.3	42.865	0.050	0.386	3.915	3.212	2.176	2.159
10.8	43.821	0.282	0.449	3.817	3.251	2.195	1.681
12.3	45.293	0.007	-0.539	3.159	2.854	2.102	0.017
13.8	44.588	0.067	-0.731	3.031	2.884	2.068	-1.128

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D1-0.23-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
4	D1-0.23-4	0.050	0.212	0.00023	0.82	3.42E-03	0.415	1.53E-03	9.43E-06

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	29.324	-0.334	1.009	5.495	5.225	2.239	4.083
1.1	30.602	-0.441	0.879	5.769	5.131	2.832	6.502
1.6	32.112	-0.360	0.705	5.694	5.147	3.080	7.359
2.1	32.873	-0.276	0.439	5.673	4.704	3.093	6.963
2.6	34.324	-0.399	0.515	5.776	4.535	3.067	8.169
3.1	36.150	-0.290	0.356	5.685	4.134	2.850	6.917
3.6	37.449	-0.326	0.222	5.409	4.017	2.637	6.532
4.1	38.562	-0.403	0.169	4.845	3.792	2.474	4.901
4.6	39.180	-0.251	0.203	4.515	3.694	2.413	4.210
5.1	40.574	-0.248	0.074	4.531	3.481	2.321	4.059
6.1	41.744	-0.203	0.188	4.056	3.175	2.261	3.313
7.1	42.843	-0.227	0.299	3.842	3.065	2.133	2.613
8.6	43.344	-0.147	0.586	3.688	2.986	2.134	2.160
10.1	43.846	-0.067	0.873	3.535	2.906	2.134	1.707
11.6	45.322	0.362	-0.309	3.136	3.267	2.096	-0.213
13.1	44.768	-0.012	-0.625	2.960	2.914	2.000	-0.916
14.6	43.882	-0.107	-0.852	2.862	2.909	1.862	-0.745

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D1-0.23-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
5	D1-0.23-5	0.050	0.206	0.00023	0.75	2.87E-03	0.426	1.45E-03	1.67E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	31.629	-0.514	0.705	4.855	4.749	1.981	3.188
1.1	33.736	-0.457	0.621	5.048	5.064	2.466	4.391
1.6	34.572	-0.503	0.495	5.243	4.723	2.679	4.969
2.1	35.761	-0.415	0.549	5.486	4.399	2.822	6.595
2.6	36.921	-0.355	0.409	5.517	4.214	2.935	7.495
3.1	37.810	-0.277	0.313	5.283	4.029	2.798	6.433
3.6	38.665	-0.362	0.153	4.964	4.013	2.647	5.383
4.1	39.691	-0.313	0.140	4.950	3.853	2.538	5.059
4.6	41.425	-0.523	-0.071	4.435	3.630	2.393	4.018
5.6	42.465	-0.379	-0.027	4.332	3.234	2.246	3.355
6.6	43.482	-0.319	0.163	4.100	3.095	2.166	2.815
8.1	44.374	-0.183	0.278	3.719	2.973	2.170	2.136
9.6	44.681	-0.273	0.645	3.527	2.850	2.066	2.114
11.1	46.023	0.164	0.061	3.256	3.052	2.120	-0.008
12.6	45.477	0.050	-0.564	2.978	2.871	1.997	-0.762
14.1	44.727	-0.064	-0.726	2.894	2.831	1.909	-0.924
15.6	43.940	-0.203	-0.677	2.777	2.817	1.700	-0.584

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D1-0.23-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
6	D1-0.23-6	0.050	0.202	0.00023	0.57	2.46E-03	0.432	1.37E-03	1.92E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	33.714	-0.569	0.319	4.835	4.683	1.952	3.479
1.2	35.364	-0.725	0.262	4.982	4.216	2.213	3.906
1.7	36.401	-0.425	0.092	4.881	4.196	2.514	4.725
2.2	36.892	-0.473	0.078	5.035	3.981	2.571	5.163
2.7	38.466	-0.236	-0.042	4.914	3.981	2.636	5.245
3.2	39.322	-0.429	-0.125	4.993	3.737	2.647	5.653
3.7	40.619	-0.409	-0.376	4.752	3.742	2.432	4.310
4.2	40.752	-0.394	-0.152	4.789	3.571	2.497	5.170
4.7	41.736	-0.316	-0.243	4.471	3.441	2.414	4.481
5.2	42.619	-0.458	-0.333	4.401	3.312	2.352	4.086
6.2	43.812	-0.285	-0.207	3.829	3.042	2.128	2.101
7.7	44.907	-0.184	-0.076	3.401	2.873	2.106	1.858
9.2	45.294	-0.142	-0.125	3.237	2.854	2.056	1.035
10.7	45.681	-0.099	-0.174	3.073	2.835	2.005	0.213
12.2	45.371	-0.139	-0.505	2.939	2.906	1.955	-0.214
13.7	45.060	-0.178	-0.835	2.806	2.978	1.904	-0.642
15.2	44.579	-0.408	-0.698	2.824	3.029	1.693	-0.500

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D1-0.23-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
7	D1-0.23-7	0.050	0.200	0.00023	0.52	2.30E-03	0.445	1.31E-03	2.26E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	33.454	-0.523	0.280	4.757	4.382	1.610	2.846
1	35.475	-0.412	0.246	4.850	4.270	2.036	3.919
1.5	37.026	-0.485	0.035	4.599	4.042	2.328	3.958
2	37.743	-0.430	-0.186	4.704	3.992	2.427	4.273
2.5	38.265	-0.482	0.015	4.766	4.011	2.645	5.026
3	39.774	-0.403	-0.336	4.604	3.751	2.482	4.611
3.5	40.058	-0.360	-0.418	4.636	3.673	2.604	4.873
4	41.222	-0.296	-0.581	4.718	3.601	2.458	4.983
4.5	42.098	-0.430	-0.631	4.680	3.438	2.509	5.200
5	43.046	-0.403	-0.792	4.291	3.199	2.362	4.150
6	43.770	-0.412	-0.616	4.266	3.114	2.310	3.840
7.5	45.038	-0.313	-0.642	3.695	2.908	2.096	2.441
9	44.860	-0.277	0.113	3.601	2.913	2.349	2.658
10.5	46.349	-0.129	-0.281	3.383	2.972	2.138	1.215
12	47.838	0.018	-0.675	3.165	3.030	1.928	-0.228
13.5	47.021	-0.278	-1.189	2.539	2.558	1.695	-0.265

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D1-0.23-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
8	D1-0.23-8	0.050	0.220	0.00023	1.45	5.36E-03	0.402	1.64E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	-0.570	0.442	1.420	2.685	3.983	1.186	-0.064
1.1	0.067	1.153	1.333	3.698	4.376	1.976	1.776
1.6	9.350	-0.186	-0.321	7.396	6.461	3.280	14.493
2.1	24.593	-0.893	-1.774	7.704	5.443	2.821	13.120
2.6	33.373	-1.170	-1.441	5.460	4.260	2.056	5.176
3.1	36.168	-1.359	-1.079	4.841	3.958	2.163	4.243
3.6	37.731	-0.835	-1.090	4.784	3.765	2.194	4.140
4.1	38.153	-0.873	-1.043	4.677	3.883	2.386	4.222
5.1	40.195	-0.656	-1.225	4.684	3.607	2.528	4.836
6.1	40.690	-0.499	-1.090	4.256	3.429	2.501	3.892
7.1	42.631	-0.612	-1.296	4.349	3.202	2.368	3.486
8.1	44.080	-0.570	-1.153	3.911	3.030	2.161	2.921
9.6	44.320	-0.534	-0.805	3.789	3.077	2.205	2.952
11.1	45.522	-0.340	-0.791	3.334	2.668	1.926	1.105
12.6	47.095	-0.379	-1.106	2.946	2.638	1.875	-0.280
14.1	46.271	-0.039	-1.156	2.636	2.795	1.804	-0.435
15.6	44.494	-1.117	-0.920	3.739	3.394	1.787	0.481

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D2-0.23-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
9	D2-0.23-1	0.056	0.233	0.00023	3.01	1.05E-02	0.451	2.61E-03	1.46E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	2.208	0.636	-1.922	8.284	8.182	4.529	17.128
1.3	6.510	0.501	-2.153	9.342	8.657	4.903	23.478
1.8	12.615	0.363	-3.032	10.012	9.189	5.006	28.054
2.3	19.378	-0.096	-3.597	10.426	8.100	4.942	30.129
2.8	26.200	-0.080	-3.852	9.496	6.915	4.387	23.408
3.3	33.021	-0.178	-4.112	8.413	5.833	3.715	16.016
3.8	37.717	-0.286	-3.977	6.862	4.842	3.081	9.287
4.3	40.462	-0.497	-3.439	5.743	4.357	2.736	5.854
5.3	43.175	-0.306	-2.826	5.141	3.836	2.555	4.869
6.3	45.114	-0.370	-2.505	4.913	3.966	2.686	5.201
7.3	46.451	-0.229	-2.222	4.856	3.844	2.634	4.930
8.3	47.682	-0.367	-1.729	4.765	3.809	2.680	5.005
9.8	47.962	-0.167	-0.827	4.598	3.766	2.507	3.608
11.3	51.245	-0.308	-1.612	4.189	3.391	2.586	4.150
12.8	53.143	-0.358	-1.712	3.824	3.077	2.436	2.951
14.3	53.450	-0.184	-1.766	3.304	2.987	2.264	0.533
15.8	52.356	-0.300	-1.737	3.249	3.011	2.105	-1.023

Measurements of sediment pickup rate over dune-covered bed

Environmental Fluid Mechanics

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D2-0.23-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
10	D2-0.23-2	0.056	0.225	0.00023	2.60	8.61E-03	0.466	2.44E-03	1.46E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	18.312	0.532	0.151	7.955	8.251	3.961	11.570
1	20.223	0.368	-0.463	8.934	8.348	4.763	20.938
1.5	23.921	0.279	-0.920	9.326	7.593	4.833	24.120
2	27.898	0.191	-1.260	9.958	7.149	4.682	26.002
2.5	32.418	-0.024	-1.623	8.796	6.046	4.120	19.608
3	35.867	-0.224	-1.884	7.447	5.528	3.467	10.885
3.5	38.382	-0.024	-1.581	6.650	4.854	3.169	9.068
4	40.153	-0.180	-1.511	5.860	4.459	2.881	6.158
4.5	41.552	-0.135	-1.261	5.431	4.195	2.775	5.875
5.5	43.866	-0.288	-1.060	5.209	3.960	2.698	5.681
6.5	46.011	-0.265	-1.106	4.995	3.783	2.663	5.248
7.5	47.381	-0.292	-1.043	4.698	3.784	2.588	4.853
8.5	44.587	-0.384	-0.047	9.451	3.802	3.786	-19.250
10	49.094	-0.174	0.018	4.851	3.670	2.601	3.870
11.5	51.945	-0.196	-1.103	4.107	3.218	2.529	2.794
13	52.701	-0.309	-1.340	3.440	2.992	2.404	1.191
14.5	52.791	-0.430	-1.347	3.097	3.075	2.136	-0.291
16	51.805	-0.310	-1.198	3.125	2.989	2.016	-1.057

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D2-0.23-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
11	D2-0.23-3	0.056	0.217	0.00023	1.43	5.50E-03	0.465	1.94E-03	1.68E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	26.863	-0.365	1.288	6.735	7.529	2.820	5.880
0.9	29.257	-0.459	0.985	7.089	6.656	3.577	9.428
1.4	30.970	-0.210	0.548	7.316	6.364	3.933	12.503
1.9	34.044	-0.398	0.075	7.607	5.912	3.973	14.265
2.4	35.468	-0.232	0.219	7.673	5.720	3.808	14.267
2.9	38.079	-0.468	-0.189	6.802	5.112	3.472	11.411
3.4	39.589	-0.404	-0.120	6.377	4.682	3.046	8.398
3.9	41.643	-0.563	-0.138	5.727	4.495	2.911	6.278
4.4	42.677	-0.544	-0.060	5.416	4.096	2.744	5.349
4.9	43.357	-0.515	-0.045	5.137	4.063	2.681	5.107
5.9	45.099	-0.349	-0.077	4.660	3.757	2.571	4.369
6.9	46.235	-0.342	-0.021	4.562	3.593	2.512	4.513
7.9	46.783	-0.420	0.357	4.657	3.428	2.426	4.241
9.4	47.753	-0.392	0.795	4.529	3.274	2.413	2.736
10.9	50.500	-0.216	-0.252	3.794	3.217	2.403	2.605
12.4	51.305	-0.512	-1.106	3.157	2.663	2.130	0.476
13.9	51.209	-0.424	-1.161	2.904	2.659	1.941	-0.322
15.4	50.045	-0.282	-1.453	2.736	2.614	1.719	-0.973

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D2-0.23-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
12	D2-0.23-4	0.056	0.211	0.00023	1.05	4.19E-03	0.476	1.74E-03	2.43E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	32.747	-0.700	1.051	6.083	6.061	2.612	5.297
1.1	34.318	-0.200	0.918	6.317	5.725	3.258	7.768
1.6	35.786	-0.383	0.775	6.393	5.524	3.376	8.986
2.1	37.558	-0.332	0.567	6.648	5.269	3.429	10.474
2.6	38.919	-0.248	0.426	6.312	5.086	3.483	9.578
3.1	40.840	-0.375	0.292	6.505	4.904	3.331	10.389
3.6	42.456	-0.582	0.158	5.944	4.486	3.099	8.180
4.1	43.165	-0.534	0.040	5.591	4.272	2.844	6.404
4.6	44.667	-0.590	0.220	5.159	4.036	2.677	5.777
5.1	45.484	-0.507	0.088	5.074	3.874	2.580	4.946
6.1	47.819	-0.531	-0.088	4.558	3.443	2.438	4.152
7.1	48.204	-0.445	-0.024	4.361	3.439	2.430	3.775
8.6	48.755	-0.503	0.372	4.284	3.518	2.526	3.716
10.1	50.266	-0.164	0.382	3.862	3.131	2.445	2.911
11.6	51.790	0.007	-0.785	3.048	3.033	2.051	0.293
13.1	51.410	-0.381	-1.005	2.714	2.594	1.891	-0.409
14.6	50.575	-0.422	-1.208	2.652	2.606	1.792	-0.929

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D2-0.23-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
13	D2-0.23-5	0.056	0.205	0.00023	0.89	3.76E-03	0.487	1.65E-03	3.94E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	36.054	-0.729	0.647	5.790	5.461	2.293	-4.306
1.1	37.860	-0.599	0.603	5.855	5.264	2.863	-5.979
1.6	38.901	-0.783	0.510	6.309	5.015	3.204	-7.675
2.1	40.397	-0.493	0.373	6.180	5.124	3.274	-7.564
2.6	41.249	-0.618	0.336	6.219	4.970	3.372	-8.863
3.1	42.727	-0.444	0.233	5.909	4.657	3.188	-8.215
3.6	44.146	-0.545	0.031	5.871	4.406	3.096	-8.084
4.1	45.119	-0.646	-0.195	5.324	4.162	2.951	-6.810
4.6	46.656	-0.504	-0.267	5.305	3.977	2.732	-5.649
5.6	48.057	-0.675	-0.376	4.470	3.642	2.599	-4.127
6.6	49.947	-0.558	-0.275	4.109	3.234	2.378	-3.431
8.1	49.862	-0.460	0.264	3.969	3.322	2.415	-2.875
9.6	49.951	-0.354	0.983	4.103	3.271	2.222	-2.432
11.1	52.209	-0.325	-0.353	3.316	2.811	2.188	-0.940
12.6	51.920	-0.265	-1.017	2.825	2.617	1.949	0.431
14.1	51.307	-0.249	-1.167	2.672	2.609	1.755	0.806

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D2-0.23-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
14	D2-0.23-6	0.056	0.201	0.00023	0.73	3.20E-03	0.497	1.54E-03	4.32E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	38.303	-0.801	0.457	5.313	5.027	2.218	4.154
1.3	39.946	-1.090	0.410	5.614	4.955	2.723	5.675
1.8	41.703	-0.721	0.114	5.437	4.683	2.882	5.750
2.3	42.121	-0.706	0.119	5.754	4.626	3.088	7.201
2.8	43.022	-0.464	0.211	5.608	4.595	3.149	6.829
3.3	44.392	-0.596	-0.181	5.584	4.310	3.021	7.211
3.8	45.364	-0.611	-0.162	5.508	4.113	2.979	7.340
4.3	46.126	-0.441	-0.246	5.416	4.070	2.943	7.001
4.8	47.804	-0.604	-0.485	4.933	3.861	2.638	5.008
5.3	48.226	-0.597	-0.572	4.936	3.721	2.595	5.014
6.3	49.892	-0.627	-0.481	4.328	3.339	2.429	3.650
7.8	51.703	-0.474	-0.566	3.758	3.055	2.256	2.446
9.3	52.210	19.408	-0.545	3.561	26.470	2.259	2.111
10.8	52.938	-0.404	-0.725	3.026	2.822	2.044	0.578
12.3	52.636	0.043	-1.002	3.092	3.420	2.072	-0.223
13.8	52.093	-0.344	-1.201	2.653	2.552	1.838	-0.740

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D2-0.23-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
15	D2-0.23-7	0.056	0.199	0.00023	0.70	2.86E-03	0.504	1.50E-03	4.58E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	38.242	-0.755	0.245	5.340	4.661	1.785	3.780
1	40.502	-0.848	0.245	5.155	4.636	2.236	3.897
1.5	42.387	-0.888	0.092	5.360	4.476	2.540	4.959
2	43.372	-0.886	-0.164	5.233	4.428	2.774	5.347
2.5	44.231	-0.722	-0.328	5.394	4.325	2.848	5.885
3	44.934	-0.635	-0.345	5.384	4.409	2.951	6.363
3.5	46.013	-0.594	-0.508	5.111	4.184	2.838	6.155
4	46.981	-0.563	-0.538	5.295	3.979	2.889	6.983
4.5	47.642	-0.571	-0.776	5.278	3.757	2.727	5.895
5	48.611	-0.606	-0.863	4.936	3.682	2.738	5.886
6	49.907	-0.418	-0.792	4.502	3.415	2.465	4.314
7.5	52.210	-0.526	-0.945	3.861	3.040	2.235	2.576
9	54.711	-6.226	1.520	14.036	16.029	3.515	1.909
10.5	52.516	-0.356	-0.299	3.389	2.927	2.211	1.242
12	53.119	0.128	-1.066	3.251	3.177	2.007	-0.274
13.5	52.118	-0.359	-1.340	2.624	2.607	1.826	-0.611

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D2-0.23-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
16	D2-0.23-8	0.056	0.219	0.00023	2.23	7.59E-03	0.458	1.72E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	-1.000	1.107	1.684	3.183	3.972	1.482	0.439
1.2	1.124	1.488	1.261	4.581	4.957	2.324	3.593
1.7	12.282	-0.444	-0.775	9.071	7.364	3.916	22.309
2.2	28.871	-1.150	-2.285	8.113	5.615	3.041	14.861
2.7	37.058	-1.346	-1.695	5.685	4.644	2.254	5.497
3.2	39.988	-0.990	-1.331	5.391	4.376	2.424	5.419
3.7	41.904	-1.271	-1.293	5.255	4.274	2.555	5.440
4.2	42.811	-0.881	-1.275	5.169	4.173	2.628	5.588
5.2	45.025	-0.725	-1.414	4.988	4.038	2.844	6.382
6.2	45.175	-0.734	-1.054	4.877	4.013	2.787	5.443
7.2	47.480	-0.593	-1.529	5.025	3.698	2.663	5.488
8.2	48.531	-0.541	-1.240	4.528	3.365	2.563	4.930
9.7	50.178	-0.709	-0.881	4.154	3.247	2.455	2.940
11.2	51.851	-0.413	-1.226	3.587	2.863	2.148	1.946
12.7	52.941	-0.548	-1.523	3.097	2.704	1.968	0.399
14.2	52.472	-0.795	-1.601	2.808	2.712	1.901	-0.387
15.7	40.500	-2.297	1.640	7.298	3.544	1.838	-0.387

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D3-0.23-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
17	D3-0.23-1	0.061	0.233	0.00023	3.38	1.25E-02	0.475	3.22E-03	2.86E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	0.613	1.009	-1.605	9.490	9.344	5.120	23.661
1.3	6.411	0.349	-2.343	10.477	9.282	5.483	28.931
1.8	11.887	0.429	-3.216	11.163	9.710	5.624	33.737
2.3	19.682	-0.069	-3.817	11.450	9.355	5.446	33.841
2.8	27.696	-0.207	-4.209	11.296	8.231	5.038	33.365
3.3	34.422	-0.233	-4.376	9.665	6.711	4.328	21.737
3.8	41.124	-0.272	-4.402	7.947	5.461	3.584	12.943
4.3	43.882	-0.082	-4.014	6.201	4.732	3.045	6.987
5.3	47.612	-0.229	-3.276	5.325	4.289	2.770	4.724
6.3	49.549	-0.219	-2.947	5.341	4.175	2.794	5.652
7.3	51.191	-0.269	-2.612	5.201	4.143	2.811	5.479
8.3	50.684	-0.229	-1.596	5.124	4.221	2.818	5.158
9.3	48.619	-3.713	-1.237	10.194	13.592	4.242	-24.153
10.8	53.797	-0.231	-0.665	4.890	3.942	2.728	3.866
12.3	57.299	-0.333	-1.770	4.336	3.371	2.662	3.723
13.8	58.187	-0.573	-1.603	3.829	3.229	2.541	1.349
15.3	57.069	-0.751	-1.507	3.606	3.211	2.442	-0.772

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D3-0.23-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
18	D3-0.23-2	0.061	0.225	0.00023	3.27	1.11E-02	0.499	2.86E-03	3.32E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	18.077	-0.058	-0.122	9.249	9.399	4.832	18.183
1.1	21.611	-0.299	-0.598	10.328	9.212	5.506	28.600
1.6	25.403	0.215	-1.260	10.541	8.630	5.598	32.734
2.1	30.140	-0.081	-1.847	10.564	7.647	5.197	30.607
2.6	34.360	0.010	-2.121	9.749	6.869	4.538	23.479
3.1	39.335	0.042	-2.297	8.091	5.880	3.914	14.720
3.6	41.656	-0.255	-2.094	7.151	5.254	3.478	10.331
4.1	43.097	-0.147	-1.982	5.723	4.600	2.937	5.727
4.6	44.210	-0.047	-1.752	5.740	4.325	2.894	6.394
5.6	46.957	-0.205	-1.381	5.394	4.028	2.828	5.935
6.6	48.469	-0.140	-1.372	5.261	4.013	2.751	6.025
7.6	50.257	-0.289	-1.380	5.175	3.848	2.809	6.474
8.6	50.186	-0.293	-0.593	4.796	4.055	2.728	4.884
10.1	52.194	-0.188	-0.071	5.150	3.898	2.779	5.400
11.6	55.803	-0.360	-1.438	4.111	3.221	2.523	2.684
13.1	56.858	-0.560	-1.566	3.564	3.173	2.394	0.719
14.6	56.921	-0.525	-1.634	3.381	3.105	2.241	-0.322
16.1	56.239	-0.694	-1.485	3.285	3.129	2.135	-1.074

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D3-0.23-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
19	D3-0.23-3	0.061	0.217	0.00023	1.83	6.83E-03	0.514	2.29E-03	4.12E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	31.188	-0.605	1.123	7.531	7.622	4.011	11.047
1.2	34.227	-0.453	0.447	8.188	7.159	4.238	15.114
1.7	36.066	-0.113	0.296	8.470	6.732	4.428	17.314
2.2	38.912	-0.269	0.091	8.494	6.320	4.198	18.299
2.7	40.790	-0.480	-0.183	8.238	6.071	3.928	14.578
3.2	43.718	-0.476	-0.337	7.344	5.463	3.507	10.852
3.7	45.522	-0.699	-0.270	6.652	4.911	3.258	8.774
4.2	47.327	-0.531	-0.188	6.122	4.722	3.166	7.716
4.7	48.517	-0.492	-0.310	5.671	4.447	3.052	6.575
5.7	49.878	-0.527	-0.245	5.490	4.100	2.818	6.454
6.7	52.029	-0.571	-0.335	5.237	3.745	2.718	5.838
7.7	52.542	-0.610	-0.213	4.986	3.743	2.780	5.469
9.2	54.049	-0.630	0.789	4.821	3.468	2.301	3.807
10.7	56.239	-0.078	-0.622	4.054	3.276	2.491	2.314
12.2	56.786	-0.468	-1.327	3.151	2.665	2.179	0.697
13.7	56.031	-0.301	-1.466	3.076	2.737	2.127	-0.842
15.2	54.782	-0.161	-1.541	2.960	2.787	1.948	-1.309

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D3-0.23-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
20	D3-0.23-4	0.061	0.211	0.00023	1.38	5.43E-03	0.531	2.08E-03	4.73E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	36.765	-0.755	1.208	6.833	6.759	3.004	6.877
1.1	38.911	-0.576	0.916	7.004	6.507	3.724	8.921
1.6	40.230	-0.827	1.036	7.320	6.280	3.952	13.082
2.1	42.204	-0.363	0.787	7.445	5.866	3.977	13.130
2.6	43.291	-0.401	0.715	7.329	5.677	3.985	13.747
3.1	45.616	-0.459	0.283	7.128	5.298	3.542	12.109
3.6	46.636	-0.584	0.357	7.114	5.037	3.436	11.875
4.1	48.484	-0.526	0.096	6.372	4.695	3.267	9.213
4.6	49.767	-0.515	0.023	5.827	4.542	3.033	7.123
5.1	51.060	-0.574	0.060	5.540	4.276	2.952	6.923
6.1	52.657	-0.535	-0.074	4.897	3.964	2.754	4.906
7.1	54.181	-0.465	-0.021	4.765	3.585	2.610	4.679
8.6	54.795	-0.556	0.748	4.665	3.440	2.465	4.132
10.1	55.684	-0.335	0.166	4.184	3.335	2.568	3.292
11.6	57.707	0.060	-1.068	3.302	3.069	2.175	0.326
13.1	57.225	-0.397	-1.383	2.903	2.675	2.060	-0.852
14.6	56.299	-0.132	-1.542	2.817	2.657	1.928	-0.811

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D3-0.23-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
21	D3-0.23-5	0.061	0.205	0.00023	1.11	4.58E-03	0.541	1.96E-03	5.20E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	40.123	-0.744	0.919	6.328	5.767	2.549	5.386
1.1	41.758	-0.900	0.894	6.702	5.772	3.290	8.545
1.6	43.656	-0.637	0.800	6.796	5.730	3.535	9.968
2.1	44.967	-0.614	0.663	6.776	5.514	3.649	10.560
2.6	46.208	-0.781	0.593	6.820	5.400	3.672	10.693
3.1	48.005	-0.635	0.263	6.819	5.053	3.548	11.098
3.6	48.760	-0.535	0.125	6.476	4.892	3.440	10.013
4.1	50.881	-0.690	0.006	6.404	4.555	3.301	9.989
4.6	51.857	-0.616	-0.130	5.925	4.362	3.136	8.086
5.6	53.995	-0.672	-0.271	5.057	3.918	2.868	5.714
6.6	55.254	-0.691	-0.188	4.800	3.600	2.749	4.768
8.1	56.796	-0.650	-0.356	4.240	3.244	2.629	3.622
9.6	46.780	-0.931	2.789	18.816	3.280	4.297	1.917
11.1	58.141	-0.420	-0.950	3.456	2.920	2.395	0.211
12.6	57.183	-0.366	-1.523	3.009	2.839	2.132	-1.187
14.1	56.117	-0.366	-1.762	2.937	2.791	2.029	-1.173

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D3-0.23-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
22	D3-0.23-6	0.061	0.201	0.00023	0.94	4.17E-03	0.551	1.87E-03	6.33E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	43.202	-0.698	0.639	6.039	5.457	2.410	5.412
1.2	45.439	-0.550	0.448	6.015	5.422	2.950	6.067
1.7	46.678	-0.688	0.402	6.123	5.222	3.287	7.911
2.2	46.827	-0.595	0.463	6.157	5.218	3.373	8.289
2.7	48.274	-0.640	0.264	6.351	5.062	3.433	8.918
3.2	49.880	-0.833	0.016	6.358	4.821	3.293	9.134
3.7	50.877	-0.485	-0.008	6.283	4.672	3.317	9.422
4.2	52.290	-0.685	-0.201	6.060	4.531	3.155	8.509
4.7	52.999	-0.604	-0.130	5.671	4.260	3.112	8.030
5.2	53.714	-0.563	-0.303	5.546	4.056	2.988	6.799
6.2	55.308	-0.494	-0.197	4.535	3.641	2.648	4.354
7.7	57.084	-0.447	-0.338	3.903	3.173	2.468	2.593
9.2	56.020	-0.132	0.809	4.024	3.093	2.744	1.551
10.7	57.604	-0.450	-0.252	3.285	2.806	2.271	0.509
12.2	58.340	-0.099	-0.799	3.319	3.332	2.157	-0.579
13.7	57.709	-0.628	-0.909	3.016	2.792	2.062	-1.271

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D3-0.23-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
23	D3-0.23-7	0.061	0.199	0.00023	0.83	3.58E-03	0.554	1.82E-03	9.40E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	42.284	-0.734	0.243	6.051	5.208	2.014	4.611
1	44.864	-0.841	0.395	5.828	4.985	2.405	4.907
1.5	46.271	-0.726	0.361	5.817	4.981	2.824	6.625
2	47.657	-0.658	0.141	5.783	4.974	3.043	7.288
2.5	48.041	-0.509	0.220	5.958	5.082	3.203	7.578
3	49.361	-0.606	0.111	5.948	4.925	3.257	8.173
3.5	51.061	-0.698	-0.258	5.796	4.550	3.142	7.308
4	51.513	-0.508	-0.236	5.816	4.467	3.214	8.336
4.5	52.360	-0.654	-0.340	5.778	4.315	3.107	8.299
5	53.673	-0.490	-0.507	5.523	4.107	2.970	7.196
6	55.131	-0.546	-0.546	5.002	3.725	2.743	4.897
7.5	57.040	-0.555	-0.746	4.269	3.419	2.457	3.179
9	-41.919	-1.156	-2.427	5.951	2.789	1.882	3.660
10.5	58.003	-0.568	-0.315	3.652	3.042	2.368	1.163
12	58.517	-0.357	-1.088	3.279	3.233	2.127	-0.325
13.5	57.805	-0.848	-1.016	2.951	2.915	1.994	-0.863

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D3-0.23-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
24	D3-0.23-8	0.061	0.219	0.00023	3.90	1.35E-02	0.504	2.37E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.9	0.245	1.101	1.858	4.035	3.881	1.569	-0.606
1.4	-0.208	0.527	2.319	4.371	4.792	2.227	0.175
1.9	5.683	0.398	1.537	8.019	7.049	3.943	13.204
2.4	20.885	-0.629	-0.520	12.653	9.155	5.113	39.027
2.9	37.477	-2.034	-1.366	9.118	5.862	3.315	15.522
3.4	44.262	-1.702	-0.653	6.128	4.915	2.693	6.344
3.9	46.244	-1.500	-0.467	6.061	4.741	2.878	7.450
4.4	48.189	-1.200	-0.595	5.773	4.743	2.887	6.197
5.4	50.585	-1.086	-1.085	5.694	4.466	3.105	7.607
6.4	50.429	-0.822	-0.730	5.304	4.500	3.204	6.711
7.4	53.437	-0.800	-1.354	5.761	3.996	3.030	7.944
8.4	55.575	-0.727	-1.609	4.960	3.812	2.871	5.622
9.9	55.642	-0.636	-1.055	4.753	3.698	2.938	5.153
11.4	49.287	-0.588	-2.774	16.928	3.649	6.145	2.830
12.9	59.939	-0.714	-2.109	3.528	2.852	2.309	0.507
14.4	59.055	-0.765	-2.372	3.473	3.087	2.350	0.390

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D1-0.44-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
25	D1-0.44-1	0.056	0.234	0.00044	3.11	1.08E-02	0.480	2.71E-03	9.55E-06

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	2.997	2.366	-1.589	7.934	7.823	4.228	14.698
1	7.629	1.708	-2.197	9.172	8.229	4.745	21.551
1.5	13.412	1.434	-3.026	10.455	8.627	5.098	29.318
2	20.289	0.609	-3.984	10.880	8.470	5.151	31.057
2.5	26.183	0.152	-4.122	10.364	7.445	4.685	28.297
3	32.982	-0.092	-4.561	8.816	6.054	3.750	17.309
3.5	38.672	-0.078	-4.538	7.058	5.104	3.199	10.357
4	41.987	0.075	-4.058	6.049	4.415	2.758	6.636
4.5	43.795	-0.050	-3.819	5.734	4.209	2.678	5.807
5	45.813	0.086	-3.543	5.263	4.127	2.670	5.411
6	47.142	-0.198	-3.024	5.012	4.069	2.639	4.847
7	48.023	0.020	-2.603	5.082	4.024	2.723	5.495
8	49.797	0.595	-2.336	4.897	4.305	2.678	5.187
9	50.090	-0.142	-1.290	4.970	4.075	2.664	4.409
10.5	51.072	-6.405	-0.489	4.659	19.287	2.632	4.151
12	55.200	0.029	-2.130	4.031	3.117	2.364	3.334
13.5	55.937	-0.144	-1.905	3.578	2.977	2.223	2.251
15	56.005	-0.532	-1.755	3.195	2.976	1.994	0.235

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D1-0.44-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
26	D1-0.44-2	0.056	0.226	0.00044	2.12	8.15E-03	0.453	2.46E-03	1.40E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	19.774	1.755	-0.303	8.585	8.248	4.600	18.090
1.3	21.591	1.283	-0.778	8.877	7.708	4.743	20.747
1.8	24.886	1.013	-1.113	9.157	7.314	4.681	21.212
2.3	28.497	0.571	-1.317	8.886	6.594	4.228	19.441
2.8	32.072	0.167	-1.603	7.990	5.815	3.849	15.248
3.3	34.892	-0.182	-1.678	7.628	5.304	3.460	11.965
3.8	37.311	-0.362	-1.736	6.176	4.782	3.078	7.354
4.3	38.914	-0.375	-1.518	5.828	4.532	3.010	6.406
4.8	39.765	-0.249	-1.353	5.363	4.322	2.839	5.788
5.3	40.956	-0.392	-1.197	5.159	4.235	2.920	5.715
5.8	41.285	-0.353	-0.942	5.121	4.200	2.899	5.938
6.8	42.911	-0.355	-0.725	4.667	4.108	2.787	4.771
7.8	43.509	-0.426	-0.459	4.904	4.110	2.855	5.362
8.8	44.496	-0.306	-0.078	4.898	4.266	2.776	4.567
10.3	47.374	-0.825	-1.850	6.460	5.477	3.876	4.116
11.8	50.280	-0.326	-1.118	4.152	3.171	2.477	3.666
13.3	51.882	-0.302	-1.281	3.524	2.878	2.284	1.977
14.8	52.096	-0.487	-1.160	3.226	2.927	2.112	0.485

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D1-0.44-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
27	D1-0.44-3	0.056	0.218	0.00044	1.53	6.11E-03	0.499	2.23E-03	3.03E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	29.991	1.061	1.160	7.391	7.036	3.318	8.770
1.1	32.416	1.155	0.697	7.514	6.769	3.883	10.931
1.6	33.982	0.848	0.403	7.984	6.437	4.115	15.276
2.1	36.543	0.618	-0.072	7.940	6.107	4.029	15.007
2.6	39.443	0.398	-0.209	7.690	5.650	3.784	13.451
3.1	41.450	0.220	-0.244	7.062	5.218	3.353	9.914
3.6	43.496	0.114	-0.339	6.244	4.751	3.152	8.344
4.1	44.589	-0.098	-0.392	5.882	4.654	2.961	6.253
4.6	46.280	0.109	-0.275	5.342	4.239	2.814	5.337
5.1	47.230	0.023	-0.285	5.079	4.079	2.822	5.219
5.6	47.348	-0.109	-0.001	5.137	3.995	2.765	5.496
6.6	48.579	-0.214	-0.135	5.046	3.927	2.777	5.839
7.6	50.198	-0.361	-0.075	4.652	3.727	2.645	4.966
8.6	51.545	-0.382	-0.401	4.853	3.720	2.690	5.571
10.1	51.349	-0.275	0.314	4.808	3.512	2.862	5.531
11.6	54.786	0.032	-0.736	3.517	3.091	2.177	1.448
13.1	55.270	0.053	-0.978	3.184	2.885	2.050	-0.369
14.6	54.131	-0.121	-1.050	3.222	3.056	2.013	-1.404

Measurements of sediment pickup rate over dune-covered bed

Environmental Fluid Mechanics

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D1-0.44-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
28	D1-0.44-4	0.056	0.212	0.00044	0.98	4.09E-03	0.494	1.77E-03	3.86E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	35.034	-0.144	1.430	5.993	5.542	2.553	5.049
1.2	37.616	0.172	0.976	6.064	5.503	3.133	6.504
1.7	38.965	0.309	0.710	6.671	5.173	3.240	9.058
2.2	39.872	0.115	0.657	6.567	5.117	3.440	9.758
2.7	40.429	0.037	0.788	6.319	5.111	3.529	9.280
3.2	42.798	0.116	0.456	6.203	4.735	3.140	8.677
3.7	44.677	-0.117	0.220	5.539	4.484	2.953	6.326
4.2	45.809	-0.231	0.103	5.257	4.132	2.811	5.762
4.7	46.061	-0.251	0.215	5.205	3.980	2.715	5.584
5.2	47.837	-0.267	0.155	4.588	3.730	2.527	4.175
5.7	48.515	-0.186	0.162	4.529	3.748	2.541	4.091
6.7	49.790	-0.180	0.177	4.363	3.406	2.387	3.421
7.7	49.140	-0.132	0.702	4.321	3.505	2.606	3.824
8.7	50.624	-0.213	0.662	4.021	3.407	2.504	3.447
10.2	51.765	-0.365	0.735	4.014	3.273	2.489	3.131
11.7	54.127	0.551	-0.327	3.493	3.136	2.282	0.571
13.2	53.385	-0.073	-0.812	2.966	2.999	2.037	-0.408
14.7	52.321	0.134	-1.203	2.723	2.628	1.830	-1.066

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D1-0.44-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
29	D1-0.44-5	0.056	0.206	0.00044	0.94	3.81E-03	0.516	1.60E-03	4.29E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	35.989	0.544	0.620	5.821	5.224	2.032	4.657
0.9	38.866	0.086	0.566	5.852	5.238	2.658	5.057
1.4	40.314	0.249	0.468	6.141	5.152	3.036	7.254
1.9	41.513	0.284	0.452	6.081	4.977	3.197	7.768
2.4	42.620	-0.036	0.408	6.283	5.003	3.422	9.402
2.9	44.531	0.154	0.123	5.995	4.631	3.208	8.060
3.4	45.632	-0.074	0.017	5.900	4.467	3.204	8.598
3.9	46.866	-0.270	-0.135	5.421	4.348	2.974	6.888
4.4	48.035	-0.077	-0.206	5.502	4.074	2.895	7.049
4.9	49.156	-0.381	-0.280	4.901	3.833	2.685	5.497
5.9	50.870	-0.333	-0.309	4.360	3.479	2.474	3.968
6.9	52.521	-0.394	-0.161	3.931	3.105	2.281	2.856
7.9	52.755	0.093	-0.143	3.813	3.368	2.244	2.592
9.4	54.142	-0.487	-0.049	3.417	2.863	2.159	2.101
10.9	55.401	-0.040	-0.215	3.309	2.647	2.098	1.334
12.4	54.998	0.117	-0.680	2.901	2.696	1.906	-0.093
13.9	54.563	-0.121	-1.076	2.728	2.621	1.784	-1.122

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D1-0.44-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
30	D1-0.44-6	0.056	0.202	0.00044	0.73	3.09E-03	0.500	1.61E-03	5.27E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	36.308	0.270	0.634	5.593	4.904	1.871	4.412
1.1	38.959	0.259	0.478	5.404	4.807	2.281	4.257
1.6	40.540	0.269	0.306	5.399	4.676	2.718	5.607
2.1	41.342	0.310	0.301	5.527	4.618	2.850	6.159
2.6	42.057	0.140	0.304	5.510	4.726	3.027	6.668
3.1	43.661	0.227	0.024	5.415	4.515	2.978	6.480
3.6	44.129	-0.009	0.067	5.613	4.295	2.977	7.286
4.1	45.313	0.001	-0.076	5.470	4.174	2.956	7.322
4.6	46.315	-0.168	-0.250	5.343	4.201	2.898	6.986
5.1	47.832	-0.006	-0.469	5.164	3.997	2.716	5.803
5.6	47.979	-0.081	-0.431	4.738	3.917	2.665	4.904
6.6	49.945	-0.148	-0.487	4.488	3.571	2.562	4.460
7.6	50.445	-0.178	-0.237	4.205	3.288	2.487	4.115
8.6	50.123	-0.299	0.217	4.157	3.450	2.558	3.988
10.1	51.223	-0.312	0.134	3.904	3.167	2.494	3.161
11.6	54.163	-0.008	-0.431	3.480	2.826	2.045	1.034
13.1	53.871	-0.303	-0.865	2.769	2.498	1.920	-0.045

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D1-0.44-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
31	D1-0.44-7	0.056	0.200	0.00044	0.63	2.86E-03	0.517	1.83E-03	6.19E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	40.531	0.134	-0.001	5.435	4.571	2.046	4.662
1.1	42.900	0.146	-0.020	5.263	4.431	2.299	4.746
1.6	44.041	0.030	0.031	5.441	4.475	2.525	5.264
2.1	43.856	0.209	0.205	5.360	4.567	2.742	5.647
2.6	44.808	0.217	0.223	4.986	4.308	2.858	5.096
3.1	46.775	0.062	-0.286	5.254	4.299	2.864	6.336
3.6	47.822	0.172	-0.398	5.114	4.076	2.753	5.378
4.1	48.790	0.097	-0.440	5.052	3.966	2.705	5.513
4.6	48.958	0.036	-0.448	5.075	3.936	2.715	5.538
5.1	49.944	0.030	-0.492	4.684	3.760	2.621	4.561
6.1	51.161	0.017	-0.311	4.325	3.635	2.471	3.744
7.1	50.968	0.210	0.015	4.268	3.632	2.568	3.897
8.1	52.328	0.320	0.023	4.819	4.973	2.639	3.210
9.6	50.239	0.336	-0.853	4.392	3.984	2.457	2.232
11.1	54.038	0.097	0.139	3.966	2.996	2.276	1.253
12.6	55.527	0.223	-0.236	4.519	5.028	2.438	-0.444
13.6	54.220	0.233	-0.603	4.308	5.388	2.394	-0.251

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D1-0.44-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
32	D1-0.44-8	0.056	0.220	0.00044	2.16	7.78E-03	0.456	2.05E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	-2.079	0.998	1.825	2.938	3.032	1.272	0.615
1	-2.819	0.342	2.375	3.629	3.574	1.807	1.301
1.5	0.770	0.887	1.827	4.931	5.080	2.528	3.656
2	10.759	0.990	0.425	8.914	7.714	4.087	21.005
2.5	26.228	0.899	-1.180	9.574	6.422	3.619	21.582
3	36.695	0.570	-1.142	6.273	4.506	2.554	7.123
3.5	40.138	0.421	-0.998	5.513	4.438	2.560	5.859
4	41.702	0.390	-1.085	5.476	4.430	2.677	5.955
4.5	42.855	0.154	-1.192	5.165	4.433	2.901	6.051
5	43.349	0.041	-1.089	5.374	4.296	2.929	6.600
6	45.721	0.053	-1.460	5.299	4.183	2.946	6.397
7	47.168	-0.030	-1.490	5.226	3.876	2.837	6.153
8	48.508	0.036	-1.398	4.813	3.678	2.688	5.567
9.5	49.658	-0.090	-0.887	4.298	3.518	2.655	4.334
11	51.788	-0.094	-1.083	3.836	2.906	2.226	2.387
12.5	53.523	-0.021	-1.252	3.386	2.696	1.950	1.199
14	53.286	-0.040	-1.224	2.905	2.712	1.872	-0.043
15.5	53.680	0.381	-1.254	4.240	2.819	2.065	2.341

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D2-0.44-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
33	D2-0.44-1	0.061	0.232	0.00044	3.77	1.29E-02	0.496	3.19E-03	1.93E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	2.463	2.200	-1.184	8.761	8.874	4.611	17.938
1	6.936	1.897	-2.270	10.155	9.435	5.288	24.491
1.5	14.092	1.579	-3.729	11.181	9.696	5.620	34.361
2	20.169	0.754	-4.201	11.845	9.333	5.590	37.735
2.5	26.941	0.039	-4.606	11.280	8.045	4.998	32.227
3	34.508	-0.247	-4.989	9.884	6.666	4.254	22.925
3.5	39.197	-0.376	-4.890	7.918	5.876	3.555	13.133
4	42.919	-0.496	-4.651	6.934	5.215	3.140	8.981
4.5	45.125	-0.418	-4.248	6.246	4.673	3.024	7.414
5	45.674	-0.233	-3.877	5.818	4.850	3.009	6.319
6	47.631	-0.081	-3.359	5.718	4.501	3.034	6.939
7	49.180	-0.171	-3.064	5.499	4.362	3.036	6.636
8	49.672	-0.096	-2.347	5.412	4.363	3.018	6.604
9	51.855	-0.031	-2.115	5.507	4.105	2.912	6.219
10.5	51.924	-0.037	-1.291	5.170	3.830	2.895	4.895
12	56.939	-0.062	-2.107	4.004	3.194	2.278	2.514
13.5	57.689	-0.329	-1.798	3.546	3.146	2.193	0.830
15	58.348	-0.403	-1.587	3.509	3.136	2.049	0.718
16.5	58.031	-0.688	-1.250	3.799	3.266	1.954	0.209

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D2-0.44-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
34	D2-0.44-2	0.061	0.224	0.00044	2.23	8.71E-03	0.503	2.78E-03	3.57E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	23.228	2.308	-0.300	9.303	8.119	4.664	20.551
1.3	26.949	1.811	-1.216	9.500	7.724	4.736	21.195
1.8	30.574	1.303	-1.454	9.275	7.134	4.530	22.311
2.3	33.892	0.890	-1.851	8.771	6.502	4.194	18.278
2.8	37.356	0.685	-1.986	7.994	5.984	3.633	12.318
3.3	40.015	0.579	-1.969	6.982	5.400	3.299	9.168
3.8	41.628	0.396	-1.505	6.369	5.041	3.168	7.487
4.3	43.214	0.221	-1.336	5.874	4.920	3.180	7.003
4.8	44.660	0.208	-1.422	5.784	4.789	3.103	6.799
5.3	45.744	0.306	-1.322	5.607	4.617	3.045	6.603
6.3	46.867	0.034	-1.020	5.392	4.418	3.074	6.085
7.3	48.743	0.123	-0.982	5.694	4.271	3.153	7.725
8.3	48.763	0.077	-0.330	5.623	4.337	3.078	7.144
9.8	50.585	-0.083	-0.076	5.221	4.353	2.979	5.210
11.3	52.337	0.042	0.292	5.273	4.087	2.883	5.888
12.8	57.049	0.112	-1.266	4.092	3.213	2.441	2.773
14.3	57.286	0.517	-1.120	3.645	3.445	2.246	1.496
15.8	57.428	-0.354	-0.873	3.222	3.180	1.985	0.094

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D2-0.44-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
35	D2-0.44-3	0.061	0.216	0.00044	1.95	7.19E-03	0.524	2.56E-03	4.23E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	32.144	1.348	0.995	7.590	7.575	3.609	10.121
1.1	34.186	1.076	0.824	8.199	7.491	4.353	15.562
1.6	36.334	0.824	0.542	8.567	6.997	4.628	19.522
2.1	38.719	0.523	-0.015	8.318	6.441	4.314	17.344
2.6	41.094	0.273	-0.182	8.035	5.999	4.041	15.354
3.1	42.917	0.134	-0.263	7.758	5.790	3.763	13.969
3.6	46.298	0.055	-0.480	6.506	5.027	3.334	8.192
4.1	47.713	0.040	-0.469	5.874	4.774	3.079	7.075
4.6	48.663	-0.044	-0.294	5.862	4.543	2.938	6.020
5.1	49.282	-0.085	-0.128	5.595	4.398	2.989	6.072
5.6	50.450	-0.097	-0.212	5.307	4.450	2.910	5.466
6.6	51.875	-0.189	-0.238	5.061	4.117	2.806	5.141
7.6	52.989	-0.306	0.017	4.913	3.959	2.753	4.759
8.6	52.437	-0.654	0.330	5.093	4.540	2.773	4.809
10.1	56.604	-0.356	-0.859	4.703	4.072	2.657	1.150
11.6	56.996	-0.114	-0.593	4.314	3.605	2.540	2.754
13.1	57.782	-0.173	-0.818	3.772	3.346	2.370	1.213
14.6	57.294	-0.158	-0.986	3.428	3.256	2.152	-0.874
16.1	56.215	-0.059	-1.038	3.267	3.244	2.130	-1.466

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No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
36	D2-0.44-4	0.061	0.210	0.00044	1.29	5.34E-03	0.549	2.09E-03	6.21E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	39.278	0.788	1.055	6.864	6.162	2.886	7.025
1.2	41.159	0.397	0.769	7.023	6.210	3.544	9.567
1.7	42.834	0.322	0.589	7.452	6.012	3.891	11.823
2.2	44.523	0.378	0.508	7.356	5.674	3.844	12.921
2.7	45.942	0.132	0.324	7.110	5.541	3.775	12.304
3.2	47.905	-0.047	0.249	7.017	5.282	3.567	11.272
3.7	49.723	-0.103	0.001	6.408	4.756	3.304	9.391
4.2	50.784	-0.274	0.077	6.113	4.725	3.249	8.891
4.7	52.545	-0.322	-0.053	5.433	4.237	2.886	5.680
5.2	52.976	-0.179	0.075	5.155	4.165	2.895	5.180
5.7	53.850	-0.230	-0.024	4.955	3.988	2.785	5.471
6.7	55.165	-0.134	0.105	4.547	3.729	2.721	4.609
7.7	55.669	0.026	0.199	4.658	3.808	2.709	4.178
8.7	56.434	-0.256	0.457	4.388	3.731	2.697	4.147
10.2	57.207	-0.469	0.352	4.503	2.921	2.708	4.105
11.7	59.421	0.119	-0.498	4.009	3.025	2.378	0.444
13.2	59.088	0.179	-1.198	3.079	3.130	2.038	-0.700
14.7	58.061	0.055	-1.203	2.880	2.792	1.998	-0.882

Measurements of sediment pickup rate over dune-covered bed

Environmental Fluid Mechanics

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D2-0.44-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
37	D2-0.44-5	0.061	0.204	0.00044	1.11	4.39E-03	0.557	2.02E-03	7.31E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	39.482	0.460	0.505	6.417	5.802	2.201	5.279
0.9	42.277	0.554	0.677	6.433	5.644	2.954	7.219
1.4	44.655	0.600	0.539	6.689	5.666	3.295	8.172
1.9	45.433	0.381	0.506	6.688	5.517	3.543	9.454
2.4	46.760	0.193	0.381	6.679	5.430	3.714	11.075
2.9	49.245	0.151	0.144	6.349	4.979	3.539	10.393
3.4	50.091	-0.152	-0.167	6.496	4.868	3.400	9.656
3.9	51.678	-0.219	-0.175	6.105	4.711	3.262	8.645
4.4	52.894	-0.127	-0.211	5.848	4.505	3.166	7.902
4.9	53.753	-0.193	-0.274	5.372	4.319	2.902	6.588
5.4	54.708	-0.173	-0.386	5.141	3.942	2.875	6.088
6.4	55.722	-0.242	-0.129	4.760	3.699	2.764	4.646
7.4	56.468	-0.389	0.241	4.290	3.776	2.619	3.665
8.4	57.340	-0.229	-0.215	4.348	3.533	2.697	3.734
9.9	57.601	-0.406	0.380	3.867	3.484	2.937	7.892
11.4	60.044	0.316	-0.270	3.896	3.691	2.488	0.640
12.9	59.666	-0.109	-1.281	3.445	3.210	2.168	-0.485
14.4	58.453	0.042	-1.565	3.087	2.928	1.952	-1.680

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D2-0.44-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
38	D2-0.44-6	0.061	0.200	0.00044	0.95	3.94E-03	0.556	1.88E-03	7.72E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	40.594	0.546	0.672	6.095	5.438	2.068	5.000
1.1	43.108	0.436	0.532	5.996	5.306	2.648	6.080
1.6	45.476	0.311	0.452	6.324	5.438	3.029	7.499
2.1	46.546	0.427	0.177	6.052	5.072	3.145	7.540
2.6	47.601	0.312	0.210	6.080	5.054	3.401	8.423
3.1	48.123	0.207	0.116	6.294	5.021	3.418	9.473
3.6	49.428	0.148	-0.082	6.105	4.887	3.421	9.329
4.1	51.057	0.252	-0.229	5.897	4.763	3.296	8.412
4.6	51.969	0.032	-0.490	5.834	4.448	3.143	8.235
5.1	52.719	0.161	-0.562	5.470	4.370	3.099	7.183
5.6	53.637	-0.062	-0.511	5.220	4.078	3.003	6.484
6.6	55.258	-0.061	-0.500	4.912	3.804	2.791	5.168
7.6	55.631	-0.125	-0.331	4.606	3.673	2.681	4.271
9.1	56.212	-0.189	0.107	4.517	3.621	2.653	4.217
10.6	58.850	0.041	-0.585	3.668	2.959	2.457	2.768
12.1	60.395	0.081	-1.062	3.523	3.096	2.140	0.570
13.6	59.634	-0.104	-1.612	2.716	2.538	1.995	-0.292
14.6	59.103	-0.188	-1.436	2.722	2.562	2.026	-0.561

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D2-0.44-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
39	D2-0.44-7	0.061	0.198	0.00044	0.74	3.36E-03	0.564	2.14E-03	1.04E-04

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	44.465	-0.014	-0.046	6.022	5.122	2.185	5.516
1.2	46.433	0.102	-0.037	5.798	4.920	2.640	6.109
1.7	48.084	0.048	-0.041	5.528	4.722	2.788	6.170
2.2	48.826	-0.095	-0.129	5.732	4.677	2.956	6.508
2.7	49.747	-0.081	-0.293	5.685	4.753	3.133	6.934
3.2	50.873	0.129	-0.317	5.591	4.558	3.095	6.674
3.7	51.971	-0.149	-0.436	5.439	4.462	2.944	6.414
4.2	52.984	-0.007	-0.539	5.637	4.269	2.943	7.390
4.7	53.775	-0.073	-0.706	5.460	4.141	2.873	6.164
5.2	54.601	0.028	-0.669	5.272	4.091	2.937	6.436
6.2	55.716	-0.165	-0.484	5.010	3.834	2.732	5.643
7.2	56.889	0.308	-0.274	4.316	3.804	2.595	3.807
8.2	57.272	0.108	0.055	4.476	3.567	2.442	3.715
9.7	58.743	0.116	-0.240	4.035	3.330	2.536	2.369
11.2	60.097	0.370	-0.742	4.054	3.419	2.509	1.128
12.7	60.113	-0.002	-1.166	4.177	3.648	2.566	-0.107
13.7	58.966	0.172	-1.717	3.776	3.878	2.378	-0.967

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D2-0.44-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
40	D2-0.44-8	0.061	0.218	0.00044	2.70	9.61E-03	0.494	2.51E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	-1.578	0.735	1.730	2.980	3.162	1.151	-0.436
1	-3.364	0.588	2.559	3.863	3.969	1.923	1.237
1.5	0.762	1.621	1.927	5.453	5.703	2.754	4.288
2	12.676	2.048	0.115	10.105	8.410	4.395	27.008
2.5	30.698	1.061	-1.404	10.753	6.854	3.847	26.364
3	40.631	0.893	-1.278	6.696	4.959	2.681	8.109
3.5	44.178	0.620	-1.087	6.022	4.870	2.785	7.177
4	46.322	0.630	-1.182	5.919	4.878	2.878	7.184
4.5	47.582	0.511	-1.332	5.775	4.873	3.058	7.952
5	48.189	0.476	-1.221	5.719	4.760	3.122	7.513
6	50.334	0.365	-1.504	5.720	4.401	3.194	7.950
7	51.703	0.235	-1.527	5.667	4.250	3.186	7.838
8	52.814	0.130	-1.393	5.520	4.079	3.042	7.350
9.5	54.715	-0.156	-1.145	4.880	3.689	2.749	4.922
11	56.135	-0.039	-0.915	4.413	3.422	2.644	3.730
12.5	58.408	-0.051	-1.257	3.733	3.088	2.190	1.465
14	58.530	-0.069	-1.337	3.286	3.083	2.046	0.366
15.5	57.373	-0.341	-0.886	4.802	3.196	2.013	1.338

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D3-0.44-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
41	D3-0.44-1	0.067	0.231	0.00044	3.86	1.51E-02	0.536	3.72E-03	3.08E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	4.024	3.443	-1.395	9.349	9.564	4.702	19.828
1	8.655	1.962	-2.845	11.190	10.311	5.734	32.348
1.5	13.483	1.596	-3.444	12.252	10.723	6.004	38.636
2	21.157	0.811	-4.464	12.544	9.909	5.802	38.436
2.5	28.767	0.509	-4.843	11.971	8.773	5.470	38.110
3	35.757	-0.030	-5.328	10.396	7.335	4.550	26.168
3.5	41.661	-0.363	-5.361	8.810	6.272	3.794	15.759
4	45.524	-0.281	-4.993	7.394	5.546	3.327	9.823
4.5	47.769	-0.117	-4.649	6.732	5.298	3.224	8.185
5	48.543	-0.123	-3.877	6.389	5.068	3.260	8.236
6	51.402	-0.172	-3.487	6.295	4.827	3.230	7.867
7	52.768	-0.007	-3.248	5.957	4.718	3.179	7.511
8	54.355	-0.255	-2.723	5.811	4.576	3.173	7.932
9	56.712	0.549	-2.393	6.221	4.618	3.096	7.769
10.5	56.151	0.107	-1.415	5.463	4.311	3.140	6.532
12	60.662	0.087	-2.064	4.550	3.411	2.468	3.358
13.5	62.649	-0.032	-1.909	3.889	3.254	2.112	0.848
15	62.390	-0.218	-1.383	3.599	3.053	2.103	0.594

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D3-0.44-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
42	D3-0.44-2	0.067	0.223	0.00044	2.86	1.03E-02	0.541	3.25E-03	5.31E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	25.885	2.693	-0.562	9.773	8.988	5.039	22.974
1.3	28.721	2.144	-1.223	10.302	8.461	5.357	28.609
1.8	32.544	1.754	-1.451	10.396	7.984	5.164	27.716
2.3	37.066	0.907	-1.978	9.806	7.224	4.570	21.471
2.8	40.689	0.462	-2.257	8.756	6.520	4.046	14.975
3.3	43.194	0.401	-2.004	7.931	5.921	3.677	12.846
3.8	45.370	0.333	-1.806	6.752	5.515	3.515	9.557
4.3	46.651	0.198	-1.457	6.398	5.306	3.285	7.728
4.8	47.981	0.245	-1.374	6.115	5.106	3.320	8.227
5.3	49.138	0.342	-1.405	6.018	4.992	3.363	8.009
6.3	50.593	0.158	-1.209	6.089	4.805	3.367	8.334
7.3	51.355	0.142	-0.845	6.026	4.719	3.248	7.703
8.3	52.856	0.146	-0.564	5.713	4.782	3.403	7.404
9.8	53.530	-0.093	0.246	5.698	4.567	3.278	6.407
11.3	56.255	0.130	0.276	5.829	4.427	3.268	5.926
12.8	60.779	0.230	-1.287	4.480	3.465	2.729	3.641
14.3	61.388	0.978	-1.211	3.912	3.562	2.388	1.765
15.8	62.046	-0.322	-0.990	3.406	3.220	2.092	-0.307

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D3-0.44-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
43	D3-0.44-3	0.067	0.215	0.00044	2.18	8.22E-03	0.562	2.79E-03	7.72E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	34.667	1.434	1.063	8.583	8.038	3.884	11.657
1.1	37.084	1.072	0.578	8.932	7.848	4.797	19.463
1.6	39.912	0.711	0.332	9.161	7.406	4.780	19.997
2.1	41.736	0.856	0.055	9.389	6.918	4.660	21.838
2.6	43.411	0.201	-0.020	8.669	6.529	4.353	16.506
3.1	46.870	0.123	-0.363	8.084	5.916	3.975	14.037
3.6	49.104	0.114	-0.318	7.185	5.460	3.528	10.182
4.1	50.649	0.142	-0.388	6.472	5.143	3.269	8.112
4.6	52.002	0.022	-0.415	5.955	4.802	3.100	6.129
5.1	53.064	-0.173	-0.253	5.734	4.796	3.111	6.476
5.6	54.202	-0.079	-0.315	5.764	4.558	3.074	6.855
6.6	55.220	-0.190	-0.242	5.399	4.503	3.048	6.564
7.6	55.472	-0.451	0.490	4.925	4.331	2.940	4.520
8.6	55.921	-0.441	0.271	6.661	4.648	3.399	-0.065
10.1	58.029	-0.153	0.633	5.292	4.131	3.024	3.190
11.6	61.478	-0.136	-0.830	4.198	3.602	2.561	2.176
13.1	62.210	-0.426	-1.599	3.723	3.130	2.252	0.232
14.6	61.803	-0.166	-1.477	3.386	3.132	2.055	-0.874
16.1	61.070	0.025	-1.232	3.254	3.089	2.186	-1.863

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D3-0.44-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
44	D3-0.44-4	0.067	0.209	0.00044	1.57	6.43E-03	0.589	2.51E-03	1.10E-04

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	41.909	0.548	1.084	7.555	6.948	3.650	10.128
1.2	44.240	0.504	0.774	8.011	6.760	4.124	13.537
1.7	46.047	0.262	0.596	8.158	6.633	4.239	14.681
2.2	47.454	0.026	0.459	8.030	6.318	4.213	15.409
2.7	48.982	-0.003	0.561	7.962	6.066	4.207	15.264
3.2	50.425	-0.049	0.322	7.832	5.618	4.042	15.650
3.7	52.132	-0.331	0.131	7.320	5.380	3.797	12.365
4.2	54.133	-0.164	0.039	6.681	5.110	3.454	9.767
4.7	55.520	-0.415	0.057	6.032	4.740	3.205	7.415
5.2	56.883	-0.299	-0.002	5.694	4.512	3.159	7.002
5.7	57.253	-0.389	0.070	5.468	4.392	3.074	5.781
6.7	58.618	-0.339	0.268	5.036	4.083	2.943	5.653
7.7	59.843	-0.245	0.369	4.995	3.980	2.808	5.215
8.7	59.853	-0.632	1.057	4.753	3.877	2.972	4.668
10.2	61.491	-2.627	-1.723	4.365	3.794	2.745	0.485
11.7	63.585	0.281	-0.443	3.977	3.710	2.517	0.907
13.2	63.522	-0.079	-0.831	3.332	3.040	2.265	-0.517
14.7	62.922	0.008	-0.573	3.244	2.816	2.165	-0.957

Measurements of sediment pickup rate over dune-covered bed

Environmental Fluid Mechanics

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D3-0.44-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
45	D3-0.44-5	0.067	0.203	0.00044	1.19	5.14E-03	0.602	2.30E-03	1.09E-04

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	42.682	0.675	0.613	6.936	6.136	2.402	6.961
0.9	46.287	0.697	0.795	6.870	6.223	3.180	8.028
1.4	48.332	0.403	0.531	7.034	6.160	3.617	9.518
1.9	49.001	0.059	0.592	7.214	5.993	3.861	11.328
2.4	50.600	0.126	0.194	7.177	5.832	3.873	11.878
2.9	52.126	0.024	0.066	6.991	5.543	3.851	11.281
3.4	54.317	0.075	-0.178	6.614	5.007	3.491	9.544
3.9	55.079	-0.381	-0.140	6.635	5.021	3.517	10.300
4.4	56.559	-0.348	-0.431	6.158	4.716	3.393	9.351
4.9	57.898	-0.352	-0.379	5.621	4.438	3.137	7.218
5.4	58.623	-0.371	-0.412	5.451	4.412	3.039	6.017
6.4	59.761	-0.376	-0.228	5.016	4.007	2.940	6.078
7.4	60.907	-0.337	-0.176	4.772	3.908	2.820	5.248
8.9	61.099	-0.620	0.368	4.557	3.667	2.897	3.948
10.4	66.183	-0.865	-2.217	4.482	3.790	2.668	13.333
11.9	64.421	0.175	-0.772	4.407	3.912	2.438	0.892
13.4	64.098	-0.026	-1.646	3.301	3.100	2.197	-1.221
14.4	63.180	-0.006	-1.728	3.106	2.885	2.016	-1.494

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D3-0.44-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
46	D3-0.44-6	0.067	0.199	0.00044	1.07	4.52E-03	0.606	2.37E-03	1.36E-04

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	45.450	0.526	0.497	6.899	5.930	2.338	7.003
1	48.372	0.761	0.479	6.720	6.051	2.937	7.307
1.5	50.216	0.481	0.254	6.901	5.563	3.337	9.268
2	50.815	0.474	0.289	6.582	5.659	3.495	8.536
2.5	52.163	0.390	0.223	6.650	5.629	3.662	10.065
3	53.922	0.315	-0.186	6.503	5.310	3.540	9.818
3.5	55.298	0.318	-0.446	6.755	5.126	3.618	10.715
4	55.683	0.137	-0.449	6.356	5.075	3.578	9.977
4.5	56.945	0.179	-0.637	6.405	4.829	3.513	9.801
5	58.597	0.141	-0.820	5.715	4.584	3.252	7.689
5.5	59.455	0.062	-0.818	5.658	4.473	3.280	7.657
6.5	60.183	-0.122	-0.615	5.416	4.186	3.096	6.899
7.5	61.326	-0.006	-0.601	4.925	4.111	2.999	4.968
8.5	62.583	0.197	-0.600	4.696	3.935	2.841	4.409
10	62.792	-0.041	-0.202	4.411	3.485	2.998	4.348
11.5	65.634	0.428	-1.132	3.892	3.001	2.347	0.517
13	64.798	0.132	-1.642	3.134	2.862	2.187	-1.042
14	63.648	-1.002	-1.623	3.184	3.820	2.164	-1.783

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D3-0.44-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
47	D3-0.44-7	0.067	0.197	0.00044	0.94	4.25E-03	0.616	2.37E-03	1.55E-04

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.7	48.3261	0.3325	0.0371	6.3691	6.2024	2.4287	6.4024
1.2	50.2665	0.3013	0.1302	6.3399	5.7075	2.759	6.83375
1.7	52.5056	-0.0694	-0.3449	6.17	5.334	3.0526	6.8792
2.2	53.4218	0.1032	-0.228	6.2597	5.1825	3.1943	6.98848
2.7	55.0076	0.0042	-0.4605	6.197	5.0192	3.3536	8.54515
3.2	55.844	-0.0547	-0.5889	6.2318	4.8815	3.3674	9.3507
3.7	57.096	-0.0017	-0.7721	5.9542	4.7427	3.248	8.12695
4.2	57.2402	0.0351	-0.6631	5.9619	4.6613	3.2467	9.08205
4.7	58.4239	-0.0974	-0.8257	5.8243	4.3882	3.1715	8.12922
5.2	59.2118	-0.1553	-0.8762	5.7069	4.326	3.1325	7.75366
6.2	61.1951	0.2113	-0.789	5.0277	4.0514	2.8528	5.62573
7.2	61.5914	0.0029	-0.6398	4.9278	4.0576	3.0009	5.45343
8.2	62.2076	0.1793	-0.5339	4.4926	3.7689	2.7133	4.12013
9.7	64.9709	-0.0275	-1.0855	4.3241	3.6184	2.7311	1.9656
11.2	65.1473	0.4561	-1.567	4.1555	3.4678	2.7488	1.97172
12.7	65.7617	-0.2925	-1.7634	4.1445	4.238	2.5444	-1.02354
13.7	64.579	0.0639	-2.1485	3.8432	3.6781	2.34	-1.50129

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D3-0.44-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
48	D3-0.44-8	0.067	0.217	0.00044	3.33	1.25E-02	0.548	2.95E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	-3.708	1.032	1.850	3.724	3.614	1.501	1.285
1	-4.070	1.363	2.689	4.315	4.379	2.137	2.081
1.5	1.251	1.906	1.994	6.554	6.611	3.243	6.898
2	13.854	1.976	0.223	11.493	9.722	4.867	33.315
2.5	34.352	1.009	-1.619	12.110	7.516	4.218	32.459
3	45.952	0.563	-1.665	7.252	5.316	2.918	9.361
3.5	49.231	0.660	-1.438	6.641	5.487	3.036	8.227
4	50.406	0.410	-1.341	6.500	5.462	3.240	9.102
4.5	52.565	0.118	-1.539	6.466	5.274	3.339	9.426
5	53.260	0.051	-1.649	6.292	5.004	3.469	9.264
6	55.030	0.062	-1.556	6.273	4.939	3.604	9.526
7	56.290	-0.042	-1.467	6.127	4.548	3.464	9.290
8	59.269	-0.095	-1.788	5.856	4.224	3.221	8.268
9.5	59.498	-0.052	-0.946	5.085	4.042	3.048	5.877
11	62.150	-0.012	-1.177	4.720	3.492	2.611	3.748
12.5	64.310	0.067	-1.715	3.576	3.121	2.347	0.930
14	64.103	-0.013	-1.402	3.581	3.085	2.258	0.169
15.5	64.417	-0.180	-1.122	4.894	3.350	2.541	3.303

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D1-0.86-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
49	D1-0.86-1	0.061	0.234	0.00086	3.24	1.14E-02	0.469	2.93E-03	6.53E-06

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	0.730	1.266	-1.868	8.119	8.062	4.331	14.929
1.3	4.370	1.153	-1.935	9.203	8.648	5.104	23.500
1.8	9.796	0.828	-2.682	10.564	9.328	5.332	32.410
2.3	16.982	0.098	-3.605	10.505	8.638	5.100	29.595
2.8	23.243	-0.167	-3.696	10.526	7.779	4.890	30.600
3.3	29.335	-0.700	-3.951	10.358	7.105	4.608	28.033
3.8	35.526	-0.546	-4.145	8.665	6.031	3.792	16.788
4.3	39.998	-0.556	-3.899	7.312	5.280	3.277	11.113
5.3	44.379	-0.654	-3.327	6.157	4.561	3.061	7.846
6.3	46.336	-0.566	-2.978	5.739	4.292	2.956	7.008
7.3	48.681	-0.685	-2.982	5.550	4.046	2.858	6.739
8.3	49.667	-0.622	-2.308	5.461	3.963	2.856	6.898
9.8	51.690	-0.748	-2.029	4.772	3.537	2.760	5.249
11.3	53.453	-0.507	-1.673	4.473	3.303	2.524	3.691
12.8	55.613	-0.428	-1.991	3.816	2.936	2.167	1.990
14.3	56.546	-0.499	-1.944	3.713	2.810	2.178	2.031
15.8	55.265	-0.494	-1.967	3.415	2.839	2.080	0.133

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D1-0.86-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
50	D1-0.86-2	0.061	0.226	0.00086	2.84	1.02E-02	0.483	2.74E-03	1.35E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	15.350	1.208	-0.007	8.095	8.851	4.021	12.137
1	18.706	0.506	-0.868	9.357	8.798	4.975	21.832
1.5	22.424	0.570	-1.411	9.889	8.839	5.312	27.120
2	26.323	0.381	-2.048	10.185	7.835	5.130	28.356
2.5	30.212	0.049	-2.141	9.564	7.218	4.762	24.694
3	34.718	-0.262	-2.544	8.727	6.487	4.178	18.047
3.5	37.969	-0.081	-2.399	8.048	5.621	3.689	13.304
4	40.159	-0.199	-2.168	7.264	5.118	3.436	11.460
4.5	42.882	-0.429	-2.279	6.516	4.761	3.165	8.243
5.5	45.301	-0.489	-1.923	5.746	4.141	2.914	6.430
6.5	46.656	-0.688	-1.781	5.476	4.012	2.831	6.273
7.5	48.070	-0.456	-1.594	5.424	3.908	2.831	6.481
8.5	49.827	-0.479	-1.479	4.715	3.708	2.733	5.088
10	50.292	-0.513	-0.911	4.659	3.657	2.740	4.491
11.5	53.849	-0.472	-1.410	4.034	3.101	2.240	2.303
13	53.974	-0.447	-0.977	4.227	2.859	2.268	3.269
14.5	55.629	-0.706	-1.395	3.274	2.889	1.931	0.643
16	55.152	-0.359	-1.327	3.268	2.788	1.876	-0.246

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D1-0.86-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
51	D1-0.86-3	0.061	0.218	0.00086	1.95	6.97E-03	0.487	2.69E-03	1.81E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	27.598	0.466	0.566	7.583	7.263	3.814	11.467
1.3	29.372	0.759	0.398	8.078	7.188	4.348	15.934
1.8	32.034	0.289	-0.229	8.408	6.894	4.607	18.692
2.3	33.619	0.370	-0.150	8.406	6.689	4.496	19.544
2.8	36.112	0.238	-0.412	8.534	6.231	4.273	18.680
3.3	39.463	0.031	-0.843	7.862	5.583	3.808	15.223
3.8	41.289	0.003	-0.879	7.152	5.183	3.444	11.661
4.3	43.395	-0.065	-0.692	6.335	4.662	3.243	9.014
4.8	44.988	0.004	-0.799	5.855	4.565	3.134	7.529
5.8	46.586	-0.084	-0.653	5.452	4.235	2.922	6.422
6.8	48.306	-0.113	-0.669	5.282	4.135	2.914	6.067
7.8	49.577	-0.234	-0.534	5.264	3.874	2.860	6.420
9.3	48.784	-0.280	0.470	4.814	3.928	2.906	4.957
10.8	51.524	-0.038	-0.042	4.902	3.858	2.805	4.391
12.3	54.483	-0.141	-1.274	4.414	3.610	2.632	2.952
13.8	54.455	0.038	-1.529	3.926	3.362	2.458	1.513
15.3	54.129	-0.118	-1.641	3.431	3.344	2.347	0.085

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D1-0.86-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
52	D1-0.86-4	0.061	0.212	0.00086	1.49	5.66E-03	0.514	2.40E-03	1.93E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	33.983	-0.070	1.040	7.044	6.633	2.820	7.764
1	35.915	0.122	0.963	7.193	6.577	3.618	10.247
1.5	37.579	-0.091	0.789	7.513	6.420	3.931	13.025
2	38.752	0.207	0.515	7.628	6.137	4.140	14.935
2.5	40.092	-0.150	0.467	7.325	5.846	4.062	14.288
3	41.609	0.087	0.179	7.545	5.533	3.801	13.260
3.5	43.576	-0.121	-0.204	7.017	5.351	3.641	12.134
4	45.117	-0.279	-0.057	6.722	4.997	3.572	11.492
4.5	45.840	-0.305	0.023	6.532	4.802	3.368	10.245
5	48.408	-0.325	-0.472	5.824	4.457	3.117	7.805
6	50.330	-0.391	-0.513	5.035	4.047	2.869	5.954
7	50.777	-0.327	-0.042	4.957	4.073	2.720	4.896
8.5	51.017	-0.657	0.492	4.974	4.013	2.778	3.829
10	52.018	-0.337	0.742	4.992	3.953	2.835	4.619
11.5	55.722	-0.057	-0.980	4.458	3.839	2.563	2.357
13	56.540	-0.301	-1.455	3.494	3.133	2.306	0.656
14.5	56.148	-0.351	-1.551	3.137	2.994	2.126	-0.559
15.5	56.003	-0.563	-1.468	3.153	3.054	2.057	-0.665

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D1-0.86-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
53	D1-0.86-5	0.061	0.206	0.00086	1.34	4.93E-03	0.535	2.29E-03	2.69E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	37.162	0.475	0.153	6.810	6.155	2.493	7.304
1	39.711	0.119	0.173	6.690	6.340	3.189	8.328
1.5	41.468	0.184	0.155	6.760	6.032	3.631	10.396
2	43.076	-0.013	0.059	6.945	5.740	3.839	11.767
2.5	44.118	0.176	-0.070	7.088	5.749	3.921	12.856
3	45.826	-0.061	-0.397	6.972	5.507	3.870	12.164
3.5	46.806	-0.176	-0.547	7.040	5.311	3.816	13.388
4	48.597	-0.077	-0.601	6.671	5.011	3.544	10.751
4.5	50.336	-0.151	-0.821	6.282	4.676	3.343	9.450
5.5	53.130	-0.103	-1.001	5.446	4.280	3.009	6.442
6.5	54.239	-0.165	-0.681	5.422	3.946	2.855	5.410
8	54.818	-0.162	-0.312	4.804	3.710	2.713	4.264
9.5	56.072	-21.934	-0.282	4.609	3.654	2.821	4.008
11	50.858	0.239	-2.019	4.047	3.599	2.552	2.293
12.5	57.972	-0.261	-1.762	3.485	3.284	2.284	0.578
14	57.355	-0.383	-1.826	3.140	3.099	2.179	-1.086
15	56.244	-0.575	-1.810	3.169	3.166	2.146	-1.369

Measurements of sediment pickup rate over dune-covered bed

Environmental Fluid Mechanics

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D1-0.86-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
54	D1-0.86-6	0.061	0.202	0.00086	1.12	4.25E-03	0.550	2.23E-03	4.45E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	38.696	0.091	0.119	6.437	5.616	2.253	6.335
1.1	42.057	0.289	0.034	6.345	5.680	2.850	7.524
1.6	43.547	0.079	-0.207	6.404	5.574	3.204	8.359
2.1	44.665	-0.121	-0.216	6.465	5.404	3.393	9.666
2.6	46.149	-0.125	-0.394	6.634	5.313	3.584	10.654
3.1	47.847	-0.011	-0.757	6.478	5.152	3.485	9.864
3.6	49.772	0.054	-0.873	6.575	4.835	3.475	10.495
4.1	49.901	0.016	-0.886	6.485	4.773	3.456	11.219
4.6	51.700	-0.092	-1.159	6.066	4.546	3.276	8.551
5.1	52.181	-0.287	-0.936	5.791	4.344	3.119	7.995
6.1	53.636	-0.257	-1.032	5.326	4.177	3.088	7.323
7.6	55.767	-0.694	-1.176	4.550	3.636	2.875	5.180
9.1	57.937	-6.282	-1.175	3.477	2.533	2.533	3.382
10.6	58.046	-0.157	-0.861	3.943	3.318	2.519	1.796
12.1	58.236	-0.017	-0.807	3.646	3.455	2.644	1.935
13.6	58.710	-0.117	-2.086	3.349	3.591	2.186	-0.664

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D1-0.86-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
55	D1-0.86-7	0.061	0.200	0.00086	0.94	4.41E-03	0.543	2.16E-03	4.97E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	41.699	-0.402	-0.262	6.630	5.725	2.677	6.752
1.3	43.752	-0.795	-0.377	6.231	5.375	2.896	7.753
1.8	45.087	-0.805	-0.572	6.279	5.625	3.150	7.344
2.3	45.826	-1.099	-0.604	6.292	6.103	3.359	6.835
2.8	47.420	-0.610	-0.578	6.354	5.514	3.454	8.436
3.3	48.762	-0.504	-0.854	6.171	4.970	3.399	9.064
3.8	49.963	-0.592	-1.041	5.979	4.684	3.398	9.350
4.3	50.637	-0.795	-1.178	5.940	4.492	3.318	9.435
4.8	52.168	-0.756	-1.472	5.820	4.338	3.243	8.664
5.8	53.386	-0.712	-1.300	5.383	4.017	3.028	7.017
6.8	54.172	-0.973	-1.155	5.073	3.918	2.869	5.960
8.3	54.234	-0.481	-0.337	5.227	3.889	3.110	6.657
9.8	55.662	-0.577	-0.860	4.109	3.472	2.797	3.593
11.3	58.099	-0.506	-2.002	3.969	3.520	2.394	0.574
12.8	57.555	-0.073	-2.384	3.478	3.785	2.122	-0.901
13.8	57.519	-0.359	-2.326	3.098	2.920	2.062	-0.703

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D1-0.86-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
56	D1-0.86-8	0.061	0.220	0.00086	3.13	1.09E-02	0.501	2.86E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	-0.128	-0.489	1.258	2.417	2.206	1.063	0.089
0.9	-1.374	-0.358	1.844	3.208	3.472	1.555	1.287
1.4	1.112	-0.678	1.580	4.543	4.750	2.312	3.515
1.9	8.410	-1.466	0.266	7.836	7.227	3.633	14.690
2.4	19.932	-0.913	-1.051	11.103	8.642	4.410	31.287
2.9	33.441	-0.618	-2.060	9.382	6.175	3.352	18.532
3.4	41.961	-0.581	-2.169	7.060	5.023	2.843	9.880
3.9	44.190	-0.882	-2.028	6.266	5.121	2.844	7.747
4.4	45.735	-0.939	-2.060	6.007	4.841	2.993	7.785
4.9	47.367	-0.832	-2.243	6.034	4.814	3.123	7.933
5.9	49.085	-0.908	-2.166	5.824	4.585	3.254	8.150
6.9	50.710	-0.792	-2.322	5.606	4.430	3.145	7.413
7.9	51.985	-0.796	-2.185	5.430	4.134	3.132	6.953
9.4	53.535	-0.679	-1.794	5.043	4.010	2.903	5.747
10.9	55.378	-0.568	-1.656	4.516	3.524	2.650	3.813
12.4	56.670	-0.124	-1.766	4.501	3.580	2.782	4.912
13.9	58.982	-2.066	-2.595	3.662	4.985	2.229	2.334
15.4	59.919	2.586	-3.254	3.640	5.141	1.523	-1.722

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D2-0.86-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
57	D2-0.86-1	0.067	0.232	0.00086	3.52	1.26E-02	0.519	3.76E-03	1.42E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	-0.717	0.960	-1.503	8.674	8.287	4.575	17.155
1.3	4.470	0.767	-2.086	9.707	8.882	5.129	26.611
1.8	11.218	0.417	-2.987	10.923	9.638	5.380	31.142
2.3	18.687	0.274	-3.267	11.412	9.550	5.491	35.225
2.8	25.939	-0.422	-3.608	11.330	8.807	5.069	32.735
3.3	34.205	-0.712	-4.161	10.794	7.443	4.686	28.671
3.8	41.095	-0.556	-4.289	8.720	6.127	3.800	17.183
4.3	45.819	-0.524	-4.106	7.655	5.201	3.355	11.175
5.3	49.766	-0.498	-3.156	6.101	4.810	2.979	6.926
6.3	51.639	-0.598	-2.761	5.887	4.506	3.002	6.922
7.3	52.605	-0.692	-2.266	5.617	4.597	3.041	6.501
8.3	52.644	-0.603	-1.323	5.199	4.559	2.973	4.462
9.8	56.162	-0.409	-1.193	5.453	4.443	3.037	5.859
11.3	59.547	-0.373	-1.856	5.086	4.037	3.036	5.506
12.8	61.034	-0.650	-1.996	4.993	3.787	2.834	3.522
14.3	61.922	-0.098	-2.238	4.425	4.198	2.778	2.816

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D2-0.86-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
58	D2-0.86-2	0.067	0.224	0.00086	3.36	1.23E-02	0.532	3.56E-03	2.87E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	16.158	1.272	-0.196	9.068	9.311	4.684	18.568
1	20.267	0.594	-0.985	10.435	9.931	5.553	28.502
1.5	24.284	0.580	-1.612	11.207	9.373	5.662	33.461
2	28.679	0.187	-1.952	11.054	8.569	5.538	33.621
2.5	34.370	0.308	-2.579	10.982	7.952	5.062	28.480
3	38.851	-0.093	-2.616	9.591	6.748	4.426	21.710
3.5	42.447	-0.243	-2.455	8.376	5.818	3.858	13.757
4	45.414	-0.372	-2.228	6.996	5.278	3.427	9.573
4.5	47.350	-0.261	-2.047	6.475	4.873	3.186	7.629
5.5	50.622	-0.389	-1.790	5.985	4.546	3.089	7.333
6.5	52.281	-0.501	-1.580	5.823	4.516	3.034	7.099
7.5	53.266	-0.444	-1.118	5.738	4.435	3.018	6.876
8.5	53.691	-0.395	-0.626	5.614	4.256	2.955	6.437
10	55.919	-0.464	0.142	5.653	4.288	2.902	4.677
11.5	59.882	-0.551	-1.113	5.236	3.819	2.926	5.109
13	60.665	-0.705	-1.153	4.611	3.849	2.767	2.528
14.5	60.800	-0.679	-1.237	3.986	3.879	2.607	-0.053
16	60.338	-0.551	-0.860	4.041	3.663	2.415	-0.613

Measurements of sediment pickup rate over dune-covered bed

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D2-0.86-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
59	D2-0.86-3	0.067	0.216	0.00086	2.26	8.45E-03	0.528	3.09E-03	4.05E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	29.526	0.722	0.806	8.306	8.219	4.205	14.964
1.3	32.036	0.668	0.350	8.930	7.915	4.812	20.111
1.8	35.198	0.509	-0.058	9.307	7.544	5.049	22.634
2.3	37.838	0.495	-0.777	9.462	7.111	4.826	22.335
2.8	40.347	0.231	-0.730	9.298	6.472	4.574	22.103
3.3	42.834	-0.145	-0.886	8.769	6.157	4.198	18.197
3.8	45.331	-0.219	-1.011	7.980	5.936	3.819	13.754
4.3	47.276	-0.313	-1.033	7.099	5.229	3.462	10.482
4.8	49.092	-0.352	-1.016	6.608	4.791	3.285	8.623
5.8	50.734	-0.442	-0.908	5.786	4.689	3.160	7.203
6.8	52.541	-0.245	-0.893	5.600	4.223	3.045	6.844
7.8	53.332	-0.320	-0.502	5.469	4.286	2.963	6.315
9.3	47.392	-0.209	1.787	5.338	4.130	2.903	5.232
10.8	54.607	-0.045	-0.276	5.208	3.973	2.843	4.148
12.3	58.217	-0.266	-1.449	4.669	3.546	2.722	2.889
13.8	59.222	-0.428	-2.102	3.697	3.381	2.546	0.340
15.3	58.335	-0.371	-2.360	3.593	3.330	2.485	-0.601

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D2-0.86-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
60	D2-0.86-4	0.067	0.210	0.00086	1.69	6.68E-03	0.564	2.72E-03	4.48E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	36.740	0.109	1.082	7.745	7.346	3.013	8.280
1	39.345	0.336	0.879	7.714	7.121	3.923	12.493
1.5	41.565	0.283	0.464	8.087	7.060	4.275	14.656
2	42.206	-0.029	0.488	8.112	6.743	4.565	16.853
2.5	43.780	0.109	0.361	8.003	6.490	4.477	16.900
3	45.036	-0.118	0.421	7.910	6.323	4.400	16.143
3.5	48.064	-0.288	0.012	7.784	5.685	3.978	15.315
4	50.226	-0.174	-0.269	7.101	5.338	3.741	12.705
4.5	51.918	-0.332	-0.432	6.929	5.013	3.574	11.810
5	53.310	-0.287	-0.641	6.037	4.849	3.280	8.011
6	55.170	-0.396	-0.501	5.470	4.400	3.061	6.346
7	56.768	-0.297	-0.528	5.242	4.189	3.014	6.293
8.5	55.612	-0.454	0.355	5.110	4.252	3.053	5.618
10	58.180	-0.405	0.378	5.048	3.953	2.848	4.587
11.5	61.189	-0.414	-0.957	4.378	3.514	2.622	2.894
13	62.161	-0.364	-1.707	3.708	3.075	2.396	0.725
14.5	61.858	-0.407	-1.810	3.402	3.113	2.315	-0.355
15.5	61.211	-0.480	-1.348	3.368	3.123	2.334	-0.703

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D2-0.86-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
61	D2-0.86-5	0.067	0.204	0.00086	1.51	5.76E-03	0.577	2.60E-03	5.76E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	39.916	0.158	0.135	7.348	6.637	2.626	7.849
1	43.083	-0.002	0.217	7.319	6.890	3.508	9.886
1.5	45.124	0.132	0.210	7.651	6.498	3.801	12.236
2	46.641	0.132	-0.036	7.340	6.357	4.056	12.198
2.5	47.660	-0.047	0.018	7.586	6.137	4.216	14.201
3	49.582	0.114	-0.128	7.396	5.923	4.210	14.990
3.5	51.305	-0.159	-0.414	7.580	5.600	4.059	15.114
4	52.593	-0.227	-0.584	7.173	5.290	3.853	13.766
4.5	54.330	-0.244	-0.629	6.902	5.059	3.767	12.290
5.5	56.798	-0.159	-0.921	5.953	4.680	3.239	8.390
6.5	58.561	-0.185	-0.847	5.367	4.167	3.025	5.973
8	59.784	-0.298	-0.651	5.123	3.988	2.959	5.617
9.5	61.010	1.021	-1.669	4.722	3.830	2.878	4.069
11	62.236	0.266	-0.225	4.320	3.672	2.798	2.520
12.5	62.697	-0.023	-1.778	3.585	3.175	2.435	0.167
14	61.461	-0.432	-2.076	3.173	3.117	2.345	-0.962
15	60.373	-0.665	-2.111	3.394	3.246	2.353	-1.826

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D2-0.86-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
62	D2-0.86-6	0.067	0.200	0.00086	1.26	4.99E-03	0.598	2.57E-03	6.83E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	42.827	-0.073	0.230	7.176	6.287	2.463	7.641
1.1	46.552	-0.295	-0.043	7.096	6.046	3.094	8.986
1.6	47.974	-0.374	-0.079	7.101	6.066	3.464	10.395
2.1	50.066	-0.286	-0.466	6.893	5.947	3.733	10.715
2.6	50.435	-0.146	-0.351	7.008	5.866	3.888	11.637
3.1	52.067	-0.513	-0.762	7.220	5.717	3.863	12.569
3.6	53.757	-0.245	-0.977	6.815	5.410	3.848	12.292
4.1	55.317	-0.362	-1.044	6.680	5.108	3.795	12.278
4.6	56.576	-0.406	-1.274	6.568	4.853	3.595	10.911
5.1	56.989	-0.468	-1.215	6.331	4.643	3.526	10.439
6.1	57.886	-0.236	-0.931	5.696	4.628	3.312	7.990
7.6	60.537	-0.727	-1.204	5.288	3.934	3.252	7.577
9.1	61.521	-0.756	-0.538	4.506	3.679	2.745	3.429
10.6	63.162	-0.433	-1.036	4.366	3.425	2.769	3.067
12.1	63.867	-0.034	-1.356	4.002	3.543	2.573	1.609
13.6	64.325	-0.288	-2.449	3.637	3.661	2.376	-0.696
14.6	63.628	-0.620	-1.925	3.484	3.266	2.453	-1.166

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D2-0.86-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
63	D2-0.86-7	0.067	0.198	0.00086	1.16	4.91E-03	0.589	2.58E-03	9.46E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	46.095	-0.819	-0.226	7.023	5.687	2.673	8.068
1.3	48.086	-0.662	-0.212	6.833	5.910	3.120	8.787
1.8	50.447	-0.583	-0.575	6.985	5.780	3.388	9.716
2.3	50.831	-0.683	-0.456	6.613	5.920	3.485	8.785
2.8	52.682	-0.639	-0.819	6.502	5.515	3.690	9.829
3.3	53.834	-0.403	-1.025	6.721	5.305	3.734	11.637
3.8	55.001	-0.570	-1.278	6.581	5.095	3.600	10.749
4.3	55.866	-0.575	-1.320	6.439	4.782	3.574	10.947
4.8	56.930	-0.598	-1.485	6.208	4.888	3.460	9.206
5.8	58.477	-0.570	-1.434	6.011	4.475	3.271	8.385
6.8	58.712	-0.463	-0.907	5.328	4.426	3.066	5.871
8.3	59.592	-0.441	-0.507	5.369	4.278	3.284	6.772
9.8	56.644	-0.480	-0.047	4.987	4.081	2.969	4.582
11.3	63.050	-0.422	-1.488	4.605	3.884	2.654	2.393
12.8	63.349	-0.406	-1.804	3.834	3.807	2.448	-0.672
14.3	62.640	-0.512	-1.842	3.476	3.231	2.455	-1.314

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D2-0.86-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
64	D2-0.86-8	0.067	0.218	0.00086	3.96	1.37E-02	0.538	3.35E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.4	1.927	0.772	0.937	2.568	2.296	0.773	-1.107
0.9	-0.735	0.094	1.843	3.532	3.564	1.597	0.441
1.4	0.947	-0.345	1.814	4.944	5.109	2.487	4.193
1.9	8.821	-1.265	0.573	9.030	8.187	4.023	19.209
2.4	22.684	-0.860	-1.413	12.352	9.760	5.019	39.627
2.9	37.938	-1.134	-2.483	10.355	7.195	3.724	21.565
3.4	45.516	-0.818	-2.172	7.391	5.627	2.980	10.272
3.9	48.431	-0.596	-2.209	6.729	5.400	3.103	9.218
4.4	50.608	-0.824	-2.294	6.495	5.331	3.208	8.339
4.9	51.709	-0.730	-2.279	6.231	5.349	3.360	8.792
5.9	53.150	-0.707	-2.157	6.444	5.127	3.546	10.223
6.9	54.797	-0.684	-2.074	6.200	4.925	3.433	9.731
7.9	56.596	-0.741	-2.221	5.948	4.637	3.266	8.067
9.4	58.232	-0.667	-2.170	5.521	4.345	3.279	7.066
10.9	61.061	-0.636	-1.921	5.116	3.811	2.670	3.585
12.4	62.981	-0.526	-1.913	4.571	3.659	2.535	3.166
13.9	63.719	0.102	-2.505	4.038	3.952	2.549	1.442
15.4	61.589	1.112	-1.788	4.418	4.599	1.877	-3.143

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D3-0.86-1

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
65	D3-0.86-1	0.072	0.231	0.00086	3.79	1.43E-02	0.558	4.01E-03	2.30E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	-0.660	1.774	-1.503	9.216	9.013	5.012	18.411
1.3	4.881	1.149	-2.201	10.834	9.997	5.640	29.370
1.8	12.019	0.536	-2.997	12.000	10.287	5.753	36.570
2.3	20.185	0.067	-3.596	12.347	10.042	5.702	37.866
2.8	29.200	-0.261	-4.069	12.239	9.680	5.572	37.788
3.3	36.734	-0.869	-4.321	11.459	7.741	4.990	31.116
3.8	44.406	-0.519	-4.393	9.632	6.453	4.003	19.712
4.3	49.860	-0.656	-4.338	7.521	5.414	3.356	10.753
5.3	54.470	-0.988	-3.513	6.315	4.996	3.125	7.124
6.3	56.385	-0.750	-3.045	6.123	4.713	3.137	7.422
7.3	57.694	-0.746	-2.337	5.771	4.790	3.140	6.691
8.3	58.844	-0.857	-1.671	6.050	4.729	3.235	6.885
9.8	60.161	-0.613	-0.572	5.573	4.919	3.174	5.093
11.3	62.542	-0.373	-0.226	5.559	4.402	3.049	5.803
12.8	67.243	-1.022	-1.809	4.760	3.699	3.033	3.957
14.3	67.665	-1.335	-1.574	4.557	3.577	3.018	1.206
15.8	65.695	-1.032	-1.390	4.278	3.604	2.650	-0.984

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D3-0.86-2

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
66	D3-0.86-2	0.072	0.223	0.00086	4.27	1.50E-02	0.562	3.94E-03	5.00E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	16.738	0.918	0.162	10.100	10.448	5.055	20.643
1	21.342	0.608	-0.848	11.385	10.678	6.044	32.901
1.5	25.301	0.500	-1.406	12.255	10.351	6.550	42.656
2	31.356	0.381	-2.215	12.533	9.655	6.168	41.945
2.5	36.331	0.326	-2.331	12.392	8.351	5.704	41.322
3	41.882	-0.264	-2.907	10.242	7.406	4.584	21.636
3.5	46.209	-0.532	-2.702	9.200	6.146	4.044	16.689
4	49.283	-0.362	-2.610	7.631	5.453	3.626	10.342
4.5	51.927	-0.419	-2.362	6.918	5.159	3.385	8.732
5.5	54.421	-0.656	-1.985	6.661	4.713	3.286	8.815
6.5	56.933	-0.508	-1.905	6.008	4.554	3.168	7.341
7.5	57.308	-0.807	-1.416	5.844	4.449	3.179	7.387
8.5	57.609	-0.404	-0.666	5.754	4.548	3.084	5.828
10	59.580	-0.524	-0.406	5.956	4.477	3.089	6.268
11.5	63.868	-0.808	-1.883	4.989	3.648	2.986	4.602
13	64.985	-0.690	-2.126	4.636	3.516	2.943	3.201
14.5	64.343	-0.681	-2.428	3.930	3.439	2.743	-0.334
16	62.563	-0.520	-2.573	3.861	3.419	2.747	-1.266

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D3-0.86-3

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
67	D3-0.86-3	0.072	0.215	0.00086	3.19	1.06E-02	0.582	3.54E-03	5.90E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	32.788	0.128	0.739	8.864	8.856	4.537	15.776
1.3	35.094	0.360	0.345	9.902	8.542	5.370	25.118
1.8	37.352	0.470	0.104	10.604	8.172	5.634	31.912
2.3	39.947	0.272	-0.447	10.388	8.033	5.309	28.063
2.8	43.496	-0.120	-0.725	9.869	7.339	4.828	23.034
3.3	46.791	-0.326	-1.031	8.995	6.655	4.435	19.341
3.8	48.623	-0.061	-0.887	8.805	6.450	4.251	17.894
4.3	50.939	-0.126	-0.923	7.547	5.694	3.738	11.492
4.8	53.498	-0.477	-1.067	6.530	5.267	3.541	9.700
5.8	55.766	-0.237	-1.014	6.059	5.001	3.340	7.866
6.8	57.606	-0.336	-0.911	6.212	4.527	3.264	7.967
7.8	57.499	0.025	-0.284	6.141	5.098	3.337	7.214
9.3	59.857	0.182	13.208	6.298	4.828	3.189	6.595
10.8	62.214	-0.477	-0.552	6.455	4.558	3.041	5.686
12.3	63.455	-0.562	-2.339	4.966	3.398	2.718	3.109
13.8	65.379	-0.434	-3.187	3.813	3.202	2.343	-0.367
15.3	65.011	-0.525	-3.134	3.497	3.185	2.343	-1.019

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D3-0.86-4

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
68	D3-0.86-4	0.072	0.209	0.00086	2.08	7.72E-03	0.589	3.00E-03	7.41E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	38.904	-0.234	1.206	7.993	7.555	3.130	9.578
1	41.709	-0.083	0.946	7.998	7.691	4.097	11.973
1.5	43.799	-0.206	0.752	8.439	7.444	4.645	17.793
2	45.012	0.307	0.665	8.743	7.351	4.899	20.794
2.5	46.462	-0.367	0.195	8.519	6.958	4.723	19.938
3	49.196	-0.255	-0.002	8.454	6.343	4.452	19.104
3.5	51.436	-0.365	-0.037	8.175	6.067	4.209	17.660
4	54.088	-0.336	-0.601	7.552	5.351	3.837	13.462
4.5	55.397	-0.330	-0.639	7.051	5.405	3.685	10.656
5	56.861	-0.414	-0.710	6.237	5.011	3.429	9.058
6	58.868	-0.350	-0.746	6.056	4.738	3.369	8.554
7	60.586	-0.376	-0.855	5.547	4.256	3.223	6.983
8.5	59.523	-0.403	0.414	5.205	4.418	3.150	5.123
10	61.632	-0.469	0.266	5.309	4.117	3.197	4.607
11.5	64.568	-0.349	-1.324	4.382	3.648	2.782	2.063
13	65.076	-0.461	-1.770	3.844	3.311	2.606	0.120
14.5	63.452	-0.430	-1.923	3.524	3.266	2.496	-1.943
15.5	62.226	-0.687	-1.517	3.392	3.234	2.603	-2.171

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D3-0.86-5

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
69	D3-0.86-5	0.072	0.203	0.00086	1.62	6.34E-03	0.614	2.86E-03	7.85E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.5	42.849	-0.028	0.407	7.550	7.054	2.712	8.474
1	47.166	-0.229	0.156	7.699	7.107	3.622	11.082
1.5	48.924	-0.206	-0.082	7.839	6.701	3.970	11.994
2	50.276	-0.441	-0.336	8.031	6.581	4.364	15.617
2.5	51.943	-0.494	-0.283	8.058	6.387	4.366	16.169
3	52.836	-0.510	-0.444	7.875	6.294	4.316	15.542
3.5	55.304	-0.369	-0.918	7.757	5.933	4.082	14.559
4	56.508	-0.418	-0.870	7.753	5.614	3.960	14.995
4.5	57.876	-0.438	-1.029	7.009	5.533	3.775	11.748
5.5	60.603	-0.444	-1.299	6.418	4.727	3.412	9.287
6.5	62.619	-0.534	-1.326	5.464	4.504	3.192	7.317
8	63.026	-0.370	-0.775	5.405	4.223	3.161	6.145
9.5	63.348	20.128	-0.404	5.352	3.990	3.278	5.777
11	65.494	-0.126	-1.165	4.983	3.756	2.877	4.130
12.5	66.466	-0.263	-3.173	3.893	3.317	2.615	0.543
14	65.662	-0.224	-3.738	3.527	3.173	2.564	-0.756
15	64.380	-0.293	-4.200	3.441	3.174	2.437	-0.720

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D3-0.86-6

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
70	D3-0.86-6	0.072	0.199	0.00086	1.44	5.68E-03	0.641	2.91E-03	9.00E-05

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.6	46.453	-0.359	-0.058	7.626	6.654	2.767	9.304
1.1	49.442	-0.240	-0.096	7.625	6.520	3.373	10.738
1.6	52.057	-0.226	-0.410	7.426	6.427	3.711	11.220
2.1	53.131	-0.171	-0.432	7.451	6.353	4.006	13.199
2.6	54.297	-0.332	-0.395	7.598	6.242	4.105	14.399
3.1	55.855	-0.235	-0.683	7.479	6.027	4.181	13.164
3.6	56.956	-0.134	-0.761	7.258	5.887	4.063	13.962
4.1	59.118	-0.221	-1.107	7.079	5.467	3.889	11.923
4.6	59.925	-0.452	-1.141	6.946	5.301	3.759	12.570
5.1	60.669	-0.389	-1.106	6.492	5.042	3.587	10.222
6.1	62.104	-0.397	-1.089	6.303	4.758	3.452	9.726
7.6	63.238	-0.604	-0.301	5.689	4.534	3.258	7.375
9.1	57.010	-0.407	2.432	5.183	4.130	3.034	7.289
10.6	67.619	-0.539	-0.729	4.677	3.727	2.811	3.051
12.1	67.850	-0.234	-0.977	4.192	3.673	2.621	3.655
13.6	69.095	-0.710	-1.178	3.708	3.620	2.432	-0.279

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D3-0.86-7

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
71	D3-0.86-7	0.072	0.197	0.00086	1.34	5.42E-03	0.633	2.87E-03	1.31E-04

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	50.053	-0.353	-0.305	7.427	6.366	2.946	9.846
1.3	52.813	-0.741	-0.443	7.314	6.216	3.321	10.847
1.8	53.970	-0.595	-0.563	6.923	6.347	3.635	9.614
2.3	54.872	-0.666	-0.731	7.146	6.134	3.874	12.150
2.8	56.109	-0.585	-0.841	7.148	5.883	3.986	13.350
3.3	58.181	-0.569	-1.209	6.890	5.818	3.834	11.039
3.8	58.614	-0.439	-1.257	7.138	5.529	3.892	12.744
4.3	59.613	-0.560	-1.345	6.964	5.168	3.907	13.252
4.8	60.501	-0.495	-1.407	6.950	4.986	3.870	12.871
5.8	61.921	-0.634	-1.449	6.093	4.783	3.536	9.137
6.8	63.993	-0.634	-1.557	5.726	4.296	3.109	6.636
8.3	63.456	-0.571	-0.639	5.290	4.615	3.377	5.923
9.8	65.305	-0.545	-0.878	5.007	4.052	3.143	4.562
11.3	67.802	-0.248	-1.859	5.240	4.003	2.976	2.623
12.8	67.251	-0.401	-2.635	3.953	4.156	2.722	-0.270
14.3	66.587	-0.492	-2.840	3.485	3.274	2.892	-1.466

Measurements of sediment pickup rate over dune-covered bed

Environmental Fluid Mechanics

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D3-0.86-8

No.	Section	Q (m ³ /s)	H (m)	D (m)	τ_{max} (N/m ²)	k_{max} (m ² /s ²)	U (m/s)	K (m ² /s ²)	E (m ³ /m ² /s)
72	D3-0.86-8	0.072	0.217	0.00086	4.34	1.52E-02	0.580	3.18E-03	0

z (cm)	u (cm/s)	v (cm/s)	w (cm/s)	u' (cm/s)	v' (cm/s)	w' (cm/s)	$-\overline{u'w'}$ (cm ² /s ²)
0.8	-2.499	0.105	2.379	3.658	3.822	1.756	1.782
1.3	-0.441	0.016	2.222	4.824	4.824	2.471	3.516
1.8	6.404	-0.973	1.332	7.929	7.595	3.802	13.931
2.3	20.633	-1.002	-0.886	13.036	10.307	5.320	43.370
2.8	39.537	-0.632	-2.669	11.528	7.580	4.060	28.459
3.3	48.903	-0.856	-2.613	8.068	5.981	3.210	12.620
3.8	52.391	-0.729	-2.406	7.413	5.727	3.318	11.115
4.3	54.578	-1.025	-2.295	6.952	5.863	3.412	10.525
4.8	55.400	-0.535	-2.330	6.825	5.639	3.598	10.259
5.8	57.439	-0.744	-2.108	6.359	5.217	3.623	9.266
6.8	59.814	-0.783	-2.550	6.733	5.146	3.790	11.658
7.8	61.716	-0.602	-2.647	6.463	4.900	3.670	11.231
9.3	62.985	-0.249	-2.173	5.746	4.597	3.332	6.782
10.8	65.424	-0.361	-1.571	4.999	4.067	2.933	4.021
12.3	68.315	-0.558	-2.401	4.320	3.493	2.807	2.820
13.8	69.223	-0.611	-2.761	4.059	3.245	2.604	1.246
15.3	68.535	-0.670	-2.489	4.203	3.647	2.307	-1.999