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Supplement of

On the contribution of grain boundary sliding type creep to firn densification – an assessment using an optimization approach

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	variant 1		variant 2		variant 3		variant 4		
	C_{var_1} $\times 10^{-4}$	RMSD	C_{var_2} $\times 10^{-4}$	RMSD	C_{var_3} $\times 10^{-15}$	RMSD	C_{var_4} $\times 10^{-15}$	RMSD	
No.	$\mathrm{K\,s^2\,kg^{-1}}$	$\mathrm{kg\,m^{-3}}$	$\mathrm{K\,s^2\,kg^{-1}}$	$\mathrm{kg\,m^{-3}}$	$\mathrm{K\,m\,s^2\,kg^{-1}}$	$\mathrm{kg\,m^{-3}}$	$\mathrm{K\,m\,s^2\,kg^{-1}}$	$\mathrm{kg\,m^{-3}}$	original profile data reference
1	0.9	7.80	0.7	7.81	0.0	8.06	0.0	8.06	Mayewski and Dixon (2013)
2	3.8	16.16	2.6	16.17	1.0	16.16	0.8	16.15	Mayewski and Dixon (2013)
3	5.7	7.91	4.2	7.27	2.4	7.99	1.8	7.41	Mayewski and Dixon (2013)
4	7.6	12.03	4.9	10.93	4.6	12.23	2.8	11.14	Mayewski and Dixon (2013)
5	8.5	8.38	4.7	9.18	7.8	7.96	4.4	8.93	Mayewski and Dixon (2013)
6	4.8	9.84	3.2	7.54	6.0	10.37	4.0	8.36	Mayewski and Dixon (2013)
7	4.2	10.87	2.5	10.37	5.2	10.55	3.2	10.11	Mayewski and Dixon (2013)
8	9.3	6.78	5.0	4.34	11.2	7.43	5.8	4.61	Mayewski and Dixon (2013)
9	2.5	18.34	2.0	15.67	3.0	18.71	2.4	15.96	Mayewski and Dixon (2013)
10	9.2	7.63	5.0	5.47	11.8	7.44	6.6	4.64	Mayewski and Dixon (2013)
11	7.0	16.44	3.9	12.62	8.8	16.67	4.8	13.17	Mayewski and Dixon (2013)
12	2.8	10.33	2.2	6.42	3.4	9.93	2.6	6.91	Mayewski and Dixon (2013)
13	9.5	10.73	4.5	8.35	10.2	11.14	5.4	8.52	Mayewski and Dixon (2013)
14	4.5	8.64	3.2	7.29	5.6	9.23	4.0	8.28	Mayewski and Dixon (2013)
15	12.9	8.13	6.1	8.43	19.6	8.67	8.8	8.40	Mayewski and Dixon (2013)
16	3.4	32.69	2.5	30.55	4.0	31.18	3.0	28.79	Mayewski and Dixon (2013)
17	9.8	10.14	4.8	10.46	12.4	10.32	6.0	9.85	Mayewski and Dixon (2013)
18	8.9	4.25	4.7	5.06	12.4	4.78	6.4	4.60	Mayewski and Dixon (2013)
19	11.0	7.50	5.0	6.03	17.8	7.80	8.2	5.81	Mayewski and Dixon (2013)
20	9.6	10.34	5.6	9.41	11.8	10.19	7.4	9.48	Medley et al. (2013)
21	5.9	16.81	3.9	15.30	7.0	16.72	4.6	15.41	Medley et al. (2013)
22	5.0	18.63	3.1	17.61	7.4	19.56	4.4	18.77	Conway (2003)
23	2.6	18.94	1.8	18.48	3.4	19.42	2.2	18.94	Conway (2003)
24	1.6	37.68	1.2	37.54	2.0	37.41	1.2	37.72	Gerland and Wilhelms (1999)
25	2.3	38.35	1.7	38.81	3.4	38.78	2.6	39.13	Graf and Oerter (2006a)
26	3.0	31.05	2.1	31.53	3.8	31.38	2.8	31.88	Graf and Oerter (2006b)
27	3.3	22.29	2.5	21.74	5.6	22.19	4.2	21.58	Graf and Oerter (2006c)
28	1.2	27.22	0.9	26.79	5.4	27.36	3.8	26.91	Schlosser and Oerter (2002)
29	2.3	28.04	1.8	28.31	4.0	28.34	3.2	28.53	Graf and Oerter (2006d)
30	2.2	31.22	1.6	31.36	3.4	31.36	2.6	31.46	Graf and Oerter (2006e)
31	2.4	20.63	1.8	20.90	3.6	20.39	2.4	20.71	Graf and Oerter (2006f)
32	2.6	12.62	1.8	12.81	3.4	12.62	2.6	12.79	Graf and Oerter (2006g)
33	1.2	30.03	1.0	30.08	1.4	30.38	0.8	30.42	Graf and Oerter (2006h)
34	1.2	3.88	0.9	3.79	1.2	4.45	0.8	4.52	Graf et al. (1999m)
35	2.1	27.61	1.6	27.52	2.8	27.11	2.2	27.35	Graf et al. (1999a)
36	1.1	26.84	0.8	26.79	1.2	26.46	1.0	26.44	Graf et al. (1999b)
37	2.2	36.05	1.8	36.07	2.0	36.12	1.6	36.21	Graf et al. (1999c)
38	1.3	8.83	0.8	8.61	1.4	7.72	1.2	7.57	Graf et al. (1999d)
39	0.9	10.34	0.7	10.30	1.2	10.27	0.8	9.96	Graf et al. (1999e)
40	0.2	15.30	0.1	15.42	0.2	15.22	0.2	15.32	Graf et al. (1999f)
41	0.4	26.05	0.3	26.06	0.6	25.73	0.4	25.96	Graf et al. (1999g)
42	0.2	19.56	0.2	19.56	0.2	19.48	0.2	19.48	Graf et al. (1999h)
43	2.2	16.04	1.7	15.48	3.4	15.70	2.6	15.29	Graf et al. (1999i)
44	1.5	17.89	1.1	17.80	1.4	17.66	1.0	17.69	Graf et al. (1999j)
45	1.1	34.96	0.9	34.97	0.4	35.19	0.2	35.22	Graf et al. (2002a)
46	0.9	39.52	0.7	39.53	0.4	39.86	0.2	39.53	Graf et al. (2002b)
47	1.0	13.32	0.8	13.40	1.0	13.55	0.8	13.60	Graf et al. (1999k)
48	1.9	14.29	1.4	14.51	2.0	15.51	1.4	15.70	Graf et al. (1999l)
49	1.0	37.52	0.8	37.53	0.4	37.92	0.2	37.86	Oerter et al. (2000c)
50	2.9	48.53	1.2	49.04	10.2	48.54	4.4	49.00	Oerter et al. (2000d)
51	5.0	34.88	3.3	33.70	6.6	34.80	4.2	33.69	Oerter et al. (2000e)
52	1.4	40.22	1.1	40.22	0.4	40.30	0.2	40.45	Oerter et al. (2000f)
53	2.3	38.99	1.8	38.97	0.6	39.22	0.6	39.12	Oerter et al. (2000b)
54	2.7	33.47	1.2	24.88	12.0	33.27	5.4	24.24	Fernandoy et al. (2010)
55	2.3	30.79	1.8	30.76	0.8	30.78	0.6	31.12	Oerter et al. (2000a)
56	7.8	24.33	4.2	25.72	9.0	24.29	4.8	25.90	Oerter et al. (2000g)
57	4.5	12.37	3.2	12.38	6.6	12.38	4.2	12.30	Wagenbach et al. (1994a)
58	3.8	29.89	2.9	29.83	4.6	30.51	3.6	30.39	Wagenbach et al. (1994b)
59	9.2	19.29	5.1	16.75	17.2	19.68	9.4	16.98	Morris et al. (2017)
60	9.6	16.04	4.8	13.87	21.4	16.35	11.2	13.97	Morris et al. (2017)
61	11.1	16.99	4.8	14.41	21.0	17.83	9.8	14.54	Morris et al. (2017)
62	12.3	19.06	6.6	18.32	25.8	19.32	13.0	18.20	Morris et al. (2017)
63	9.4	19.69	5.2	17.99	20.4	20.04	10.8	17.82	Morris et al. (2017)
64	7.9	30.85	4.1	27.24	16.8	31.36	9.2	27.75	Morris et al. (2017)
65	9.2	18.22	5.3	15.82	20.2	19.01	11.4	15.88	Morris et al. (2017)
66	6.3	18.26	3.7	15.22	14.4	18.46	8.4	15.24	Morris et al. (2017)
67	7.5	19.81	4.1	18.61	16.8	20.01	9.0	18.71	Morris et al. (2017)
68	9.0	23.41	4.9	17.48	18.8	24.14	11.0	18.18	Morris et al. (2017)
69	10.2	19.73	5.1	17.02	21.2	20.31	11.4	17.29	Morris et al. (2017)

70	11.0	17.43	5.6	16.10	23.4	18.03	10.8	16.18	Morris et al. (2017)
71	10.2	20.13	5.7	19.66	23.4	20.38	12.4	19.75	Morris et al. (2017)
72	13.1	17.15	8.0	15.88	22.0	17.54	11.6	15.71	Morris et al. (2017)
73	11.4	18.87	6.6	17.60	26.2	19.17	15.4	17.69	Morris et al. (2017)
74	11.6	18.76	6.3	18.44	30.0	19.03	15.4	18.30	Morris et al. (2017)
75	15.8	21.78	7.5	18.38	36.2	22.02	16.6	18.43	Morris et al. (2017)
76	12.1	18.07	6.6	16.41	24.2	18.43	12.8	16.18	Morris et al. (2017)
77	11.2	18.69	5.8	18.25	23.2	19.01	11.6	18.10	Morris et al. (2017)
78	14.4	20.09	7.7	18.26	34.6	20.21	18.2	18.28	Morris et al. (2017)
79	5.1	23.17	2.7	21.94	13.6	22.90	7.2	21.92	Anschütz and Oerter (2007)
80	2.5	33.32	1.6	31.68	3.2	31.70	2.0	30.42	Baker
81	10.2	50.92	4.8	43.24	42.6	50.30	20.2	43.32	Koenig et al. (2013)
82	10.6	4.95	5.3	1.47	34.4	5.32	17.4	1.70	Miège et al. (2013)
83	21.5	7.18	14.2	0.03	49.8	11.34	43.4	0.02	Miège et al. (2013)
84	9.5	5.34	5.0	0.60	26.0	6.14	13.8	1.97	Miège et al. (2013)
85	11.1	32.47	7.7	30.13	34.6	31.73	26.2	30.36	Mosley-Thompson et al. (2001)
86	6.6	17.07	3.9	15.81	13.6	17.25	8.2	15.73	Mosley-Thompson et al. (2001)
87	4.6	16.39	2.6	10.09	9.6	16.81	5.4	10.53	Mosley-Thompson et al. (2001)
88	5.5	28.57	3.0	26.72	12.2	29.00	6.8	26.89	Mosley-Thompson et al. (2001)
89	9.3	19.63	6.4	22.64	23.4	20.58	19.2	23.12	Mosley-Thompson et al. (2001)
90	4.1	36.34	2.5	32.87	9.4	37.26	6.0	34.01	Mosley-Thompson et al. (2001)
91	5.5	15.97	3.5	15.26	10.6	16.82	6.4	15.93	Mosley-Thompson et al. (2001)
92	5.6	12.73	3.7	13.01	9.6	13.33	6.4	13.44	Mosley-Thompson et al. (2001)
93	5.9	31.70	10.1	32.65	13.6	32.95	23.0	27.44	Mosley-Thompson et al. (2001)
94	4.5	16.35	3.1	13.90	7.2	17.11	4.8	14.67	Mosley-Thompson et al. (2001)
95	6.2	16.61	3.2	9.18	12.0	17.09	6.2	10.31	Mosley-Thompson et al. (2001)
96	4.9	13.52	3.3	11.92	8.4	14.51	5.4	12.82	Mosley-Thompson et al. (2001)
97	4.5	11.86	3.2	9.86	7.0	12.32	4.8	10.36	Mosley-Thompson et al. (2001)
98	5.6	23.96	3.2	21.84	11.8	24.35	6.8	22.25	Mosley-Thompson et al. (2001)
99	6.8	14.57	4.2	16.45	11.4	16.13	7.2	17.42	Mosley-Thompson et al. (2001)
100	12.0	38.00	10.1	41.25	28.4	39.16	21.6	41.45	Mosley-Thompson et al. (2001)
101	5.1	10.66	3.2	9.92	7.4	11.60	5.0	10.88	Mosley-Thompson et al. (2001)
102	3.3	21.82	2.3	20.21	4.8	22.43	3.4	20.83	Mosley-Thompson et al. (2001)
103	3.7	23.76	2.6	23.48	5.8	24.85	4.0	24.55	Mosley-Thompson et al. (2001)
104	4.9	19.93	2.6	17.44	8.4	20.37	4.6	16.73	Mosley-Thompson et al. (2001)
105	1.8	13.09	1.3	11.54	2.2	13.63	1.6	11.97	Mosley-Thompson et al. (2001)
106	3.5	56.08	1.8	57.62	8.0	55.88	4.6	57.19	Mayewski and Whitlow (2016a)
107	2.3	69.58	1.9	69.37	2.6	69.65	2.0	69.50	Mayewski and Whitlow (2016b)
108	1.9	28.10	1.4	28.02	2.2	28.46	1.6	28.29	Wilhelms (2000a)
109	0.8	39.31	0.6	39.09	0.8	39.42	0.6	39.49	Wilhelms (2000b)
110	0.5	51.81	0.4	51.71	0.6	51.69	0.4	51.66	Wilhelms (2000c)
111	0.7	44.76	0.5	44.34	0.8	44.73	0.6	44.39	Wilhelms (2000d)
112	1.8	38.18	1.4	36.65	2.2	38.36	1.6	36.80	Miller and Schwager (2000a)
113	1.2	36.39	0.9	35.74	1.4	36.74	1.0	35.98	Miller and Schwager (2000b)
114	0.9	22.62	0.7	22.34	1.0	22.75	0.8	22.41	Bolzan and Strobel (1999a)
115	2.8	18.76	2.0	17.33	3.2	19.20	2.2	17.74	Bolzan and Strobel (2001a)
116	6.6	21.27	4.2	18.89	7.0	21.40	4.6	18.99	Bolzan and Strobel (2001b)
117	3.0	26.48	2.0	24.97	3.6	26.80	2.4	25.17	Bolzan and Strobel (1999b)
118	3.3	40.81	2.3	40.74	3.8	40.88	2.6	40.83	Bolzan and Strobel (1999c)
119	2.3	20.81	1.7	19.97	2.6	21.37	1.8	20.43	Bolzan and Strobel (1999d)
120	3.7	21.31	2.5	18.53	4.4	21.86	3.2	19.18	Bolzan and Strobel (1999e)
121	2.5	23.96	1.8	22.46	2.8	24.30	2.0	22.74	Bolzan and Strobel (1999f)
122	3.6	19.97	2.4	16.72	4.4	20.52	3.0	17.20	Bolzan and Strobel (1999g)
123	2.0	33.97	1.7	34.04	2.2	34.02	1.6	34.05	Dibb (2017)
124	23.2	70.65	13.1	64.89	49.8	99.18	44.2	64.93	Harper et al. (2012)
125	14.0	99.00	7.2	87.72	49.0	99.84	25.0	88.04	Harper et al. (2012)
126	18.5	97.75	13.3	85.73	48.8	128.54	45.0	85.93	Harper et al. (2012)
127	17.3	82.94	9.0	78.33	49.4	103.66	31.4	78.16	Harper et al. (2012)
128	2.4	41.69	1.7	41.55	6.6	41.52	4.6	41.35	Harper et al. (2012)
129	4.6	57.07	2.9	53.13	16.8	56.52	7.8	52.88	Harper et al. (2012)
130	14.1	79.45	24.5	81.41	35.0	79.82	13.6	83.26	Machguth et al. (2016)
131	14.7	72.19	7.3	60.12	36.6	73.61	18.0	60.88	Machguth et al. (2016)
132	5.2	65.41	5.9	65.41	12.8	65.64	14.2	65.86	MacFerrin et al.
133	17.4	63.21	8.5	56.99	43.2	63.17	20.8	56.76	MacFerrin et al.
134	7.7	48.30	6.5	46.23	19.0	48.16	16.4	46.04	MacFerrin et al.
135	8.5	48.24	7.1	46.04	24.6	48.12	14.6	46.38	MacFerrin et al.
136	4.3	73.04	7.0	61.66	30.0	73.29	15.2	62.40	MacFerrin et al.
137	12.6	67.61	6.2	55.42	30.4	67.68	14.8	55.18	MacFerrin et al.
138	8.5	84.78	24.6	15.06	23.4	84.80	46.0	17.11	MacFerrin et al.
139	24.9	96.74	14.4	80.29	49.8	107.15	40.0	81.78	MacFerrin et al.
140	1.4	50.68	1.0	48.88	1.6	49.77	1.2	48.02	MacFerrin et al.
141	0.7	39.20	0.6	38.88	0.8	38.46	0.8	38.35	MacFerrin et al.
142	2.7	34.44	2.0	31.15	3.2	32.64	2.4	29.75	MacFerrin et al.

143	1.5	41.66	1.3	41.69	1.8	41.48	1.6	41.40	MacFerrin et al.
144	1.9	33.52	1.5	32.88	2.2	33.30	1.8	32.63	MacFerrin et al.
145	2.7	38.01	2.0	34.43	3.2	36.19	2.4	33.10	MacFerrin et al.
146	4.3	56.83	2.2	61.93	10.2	57.26	5.2	62.26	MacFerrin et al.
147	11.8	57.79	7.2	47.39	28.8	58.83	18.0	48.17	MacFerrin et al.
148	4.3	72.49	5.4	62.83	10.4	72.56	13.4	63.34	MacFerrin et al.
149	2.3	41.94	1.7	39.55	2.8	40.60	2.4	37.81	MacFerrin et al.
150	15.1	89.93	7.9	75.95	37.2	91.02	19.4	76.78	MacFerrin et al.
151	9.9	49.52	4.3	46.71	24.6	50.33	11.2	47.09	MacFerrin et al.
152	4.9	48.31	4.0	40.88	12.2	48.68	9.6	41.49	MacFerrin et al.
153	24.5	101.33	14.1	86.80	49.6	110.44	38.8	83.42	MacFerrin et al.
154	24.9	102.04	15.7	68.50	49.8	128.48	42.2	66.41	MacFerrin et al.
155	14.7	83.68	10.2	74.28	41.2	83.56	27.4	73.54	MacFerrin et al.
156	1.5	37.43	1.1	35.85	1.6	36.29	1.2	34.79	MacFerrin et al.
157	3.3	31.04	2.0	28.33	3.8	29.79	2.2	27.88	MacFerrin et al.
158	0.9	40.64	0.7	40.64	1.0	40.71	0.8	40.74	Schaller et al. (2017)
159	9.5	66.64	6.1	70.34	38.8	66.33	25.4	70.07	Miller et al. (2017)

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