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Supplement of

The role of basal hydrology in the surging of the Laurentide Ice Sheet

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- Section 1 describes the sensitivity to sliding parameter for the Water Sheet Scheme.
- Section 2 describes the sensitivity to sliding parameter for the Local Water Scheme.
- Section 3 shows the time series from the 3 different resolution tests that we undertook

1 Water Sheet Scheme sliding tests

In this section we compare the effect of the different sliding parameters on the Water Sheet Scheme.

Table 1. Summary of event statistics for tests of different sliding constants using the Water Sheet Scheme

C ($m\,Pa^{-1}\,yr^{-1}$)	period (yr)	duration (yr)	event size (10^4 km^3)	max calving (Sv)	mean speed ($km\ yr^{-1}$)
1.0	11,000	2500	430	0.06	4.6
0.4	15,000	2400	410	0.05	3.4
0.3	14,000	2500	370	0.05	2.8
0.2	13,000	2400	310	0.04	2.3
0.1	11,000	2600	250	0.05	1.4
0.05	12,000	4000	250	0.02	0.88
0.01	11,000	8000	190	0.01	0.16
0.005	——	—-	—	—-	—-

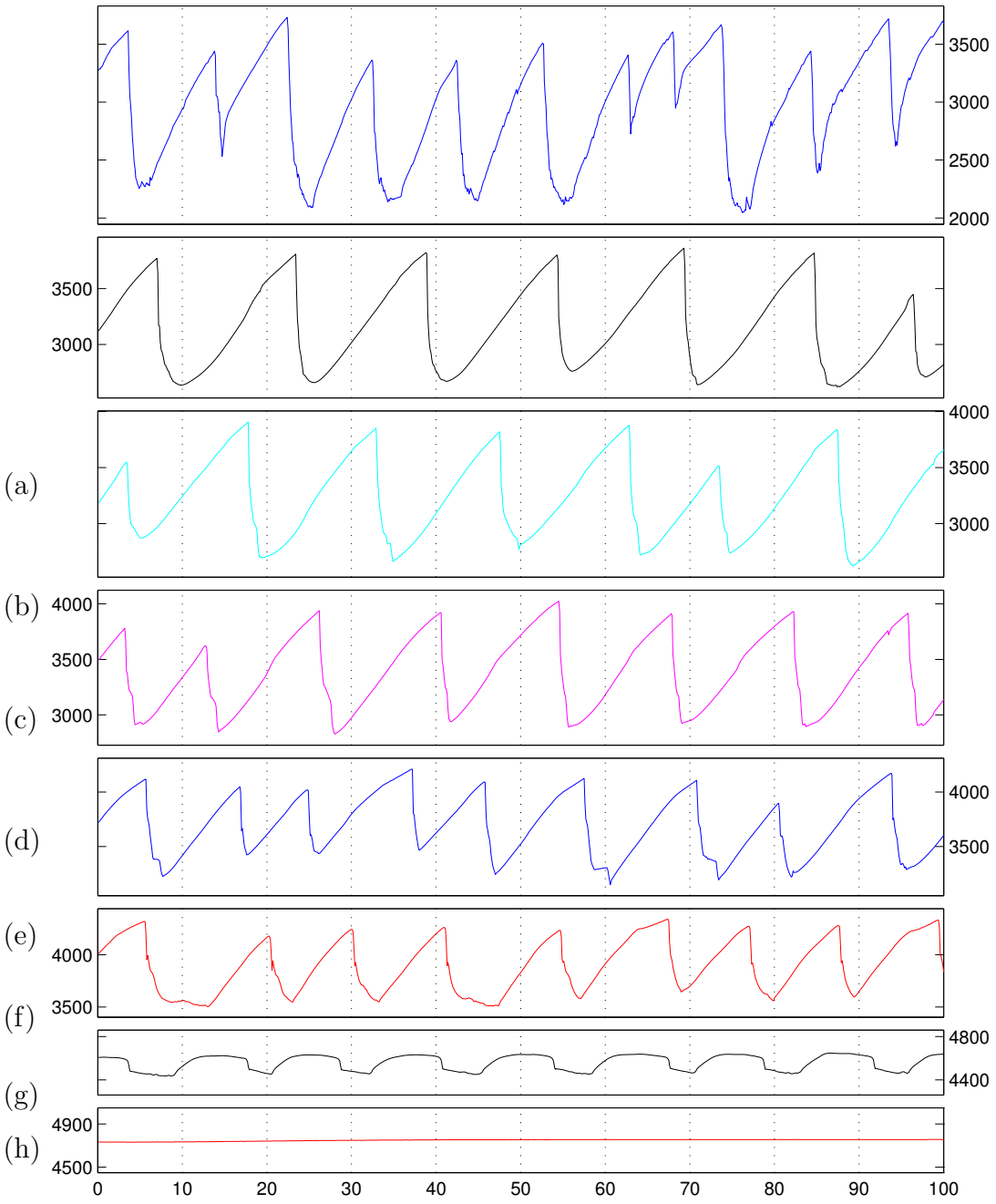

Figure 1. Time series of ice sheet height over the central Hudson Bay for a variety of sliding parameters, using the Water Sheet Scheme. Series show, from the top down (a) - (h), C=1.0, 0.4, 0.3, 0.2, 0.1, 0.05, 0.01, 0.005

2 Local Water Scheme sliding tests

In this section we compare the effect of the different sliding parameters on the local water scheme.

Table 2. Summary of event statistics for tests of different sliding constants using the Local Water Scheme

C ($m\,Pa^{-1}\,yr^{-1}$)	period (yr)	duration (yr)	event size (10^4 km^3)	max calving (Sv)	mean speed ($km\ yr^{-1}$)
1.0	——	—-	—	—	—-
0.4	10,700	2000	230	0.04	2.0
0.3	10,500	2400	240	0.03	1.5
0.2	11,700	3800	300	0.02	1.1
0.1	8,300	3500	220	0.02	0.73
0.05	9,900	5500	210	0.01	0.50
0.01	——	—-	—	—-	—-
0.005	——	—-	—	—-	—-

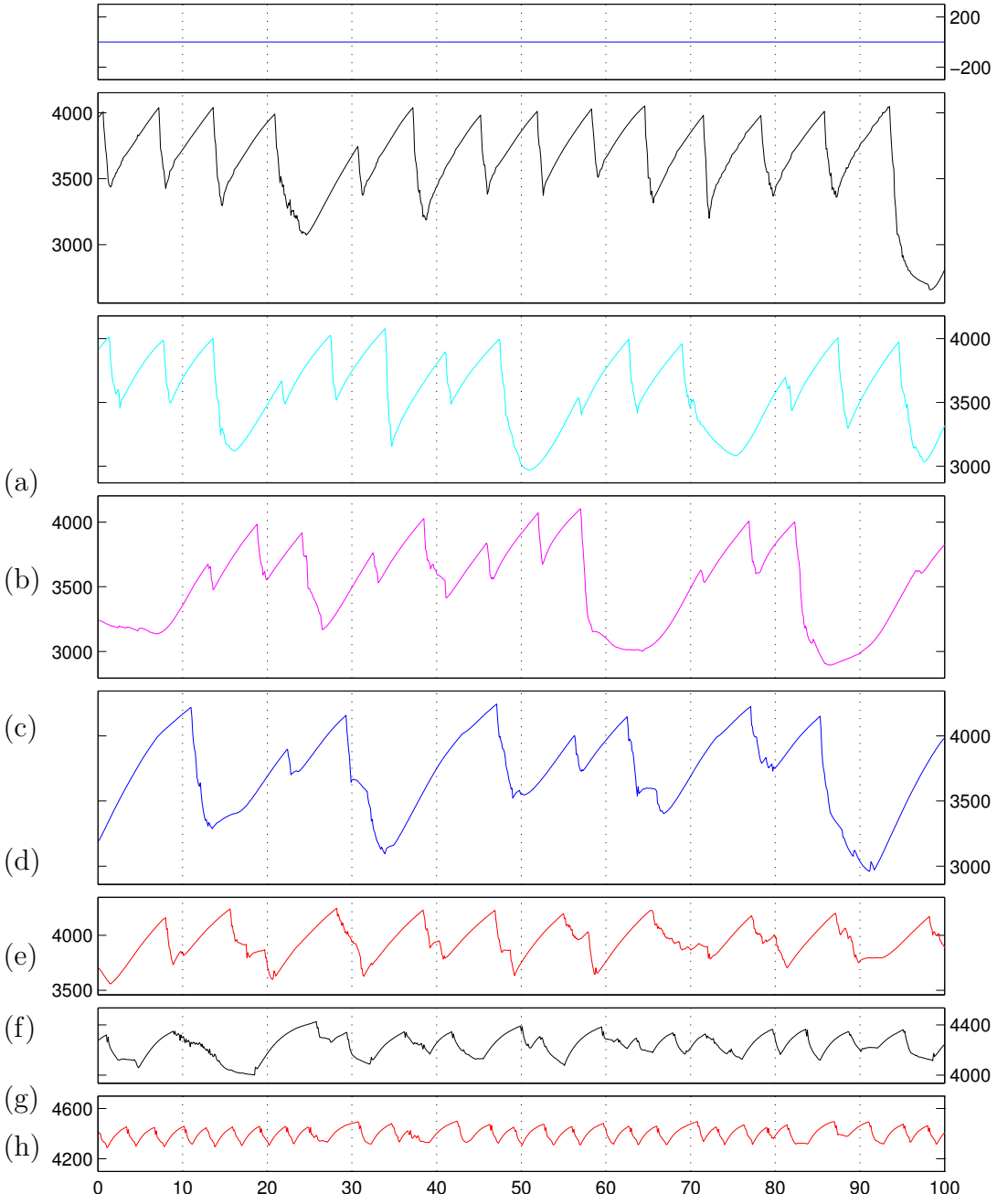

Figure 2. Time series of ice sheet height over the central Hudson Bay for a variety of sliding parameters, using the Local Water Scheme. Series show, from the top down (a) - (h), C=1.0, 0.4, 0.3, 0.2, 0.1, 0.05, 0.01, 0.005

3 Resolution tests

In this section we compare runs of the model at different resolutions We show the change in the height of the ice sheet over central Hudson Bay (top) and the calving flux from the mouth of Hudson Strait (bottom).