Supplement of

Impact of shrub branches on the shortwave vertical irradiance profile in snow

Florent Domine et al.

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Table S1. Experimental values of $(I_{r,i}/I_{0b})_c$ (at 390 nm) used for the simulations for FIELD (F) and SHRUB (S) sensors at heights of 325, 485, 650 mm, for the six overcast days investigated. No data means that the sensor was not covered by snow.

390 nm	2 Feb.	3 Feb.	23 Feb.	28 Feb.	6 Mar.	1 Apr.
F325	0.480	0.197	0.142	0.085	0.065	0.362
F485	-	-	0.281	0.170	0.126	-
F650	-	-	-	0.576	0.347	-
S325	0.171	0.049	0.024	0.008	0.006	0.459
S485	-	-	0.234	0.103	0.080	-
S650	-	-	-	0.482	0.259	-

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Table S2. Experimental values of $(I_{r,i}/I_{0r})_c$ (at 760 nm) used for the simulations for FIELD (F) and SHRUB (S) sensors at heights of 325, 485, 650 mm, for the six overcast days investigated. No data means that the sensor was not covered by snow. BDL means below detection limit.

760 nm	2 Feb.	3 Feb.	23 Feb.	28 Feb.	6 Mar.	1 Apr.
F325	0.139	0.005	BDL	BDL	BDL	0.109
F485	-	-	0.053	BDL	BDL	-
F650	-	-	-	0.245	0.077	-
S325	0.039	BDL	BDL	BDL	BDL	0.265
S485	-	-	0.033	BDL	BDL	-
S650	-	-	-	0.147	0.041	-

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30   **Figure S1. Photographs of the S325 and S485 sensors during installation on December 2nd 2020. The S325 sensor is at the center of the shrub while the S485 sensor is near its edge. The nails were hammered into the ground shortly afterwards to ensure they would not perturb radiation transfer. The snow visible here melted entirely on December 25th (Figure 6). The color stripes on the snow stake are 10 cm high.**

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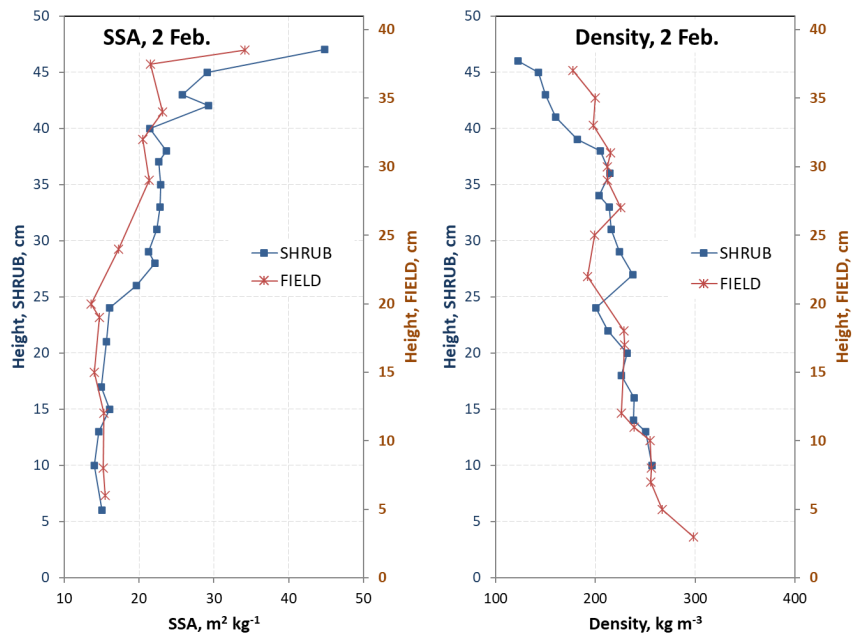
Figure S2. Vertical profiles of snow specific surface area and density measured at an open spot similar to FIELD and at a spot in shrubs similar to SHRUB on February 2nd 2021.

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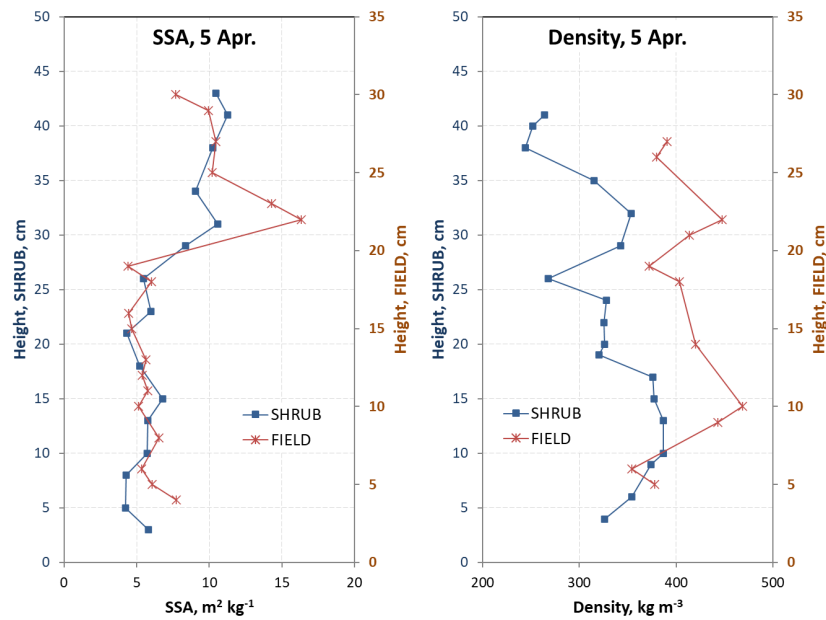


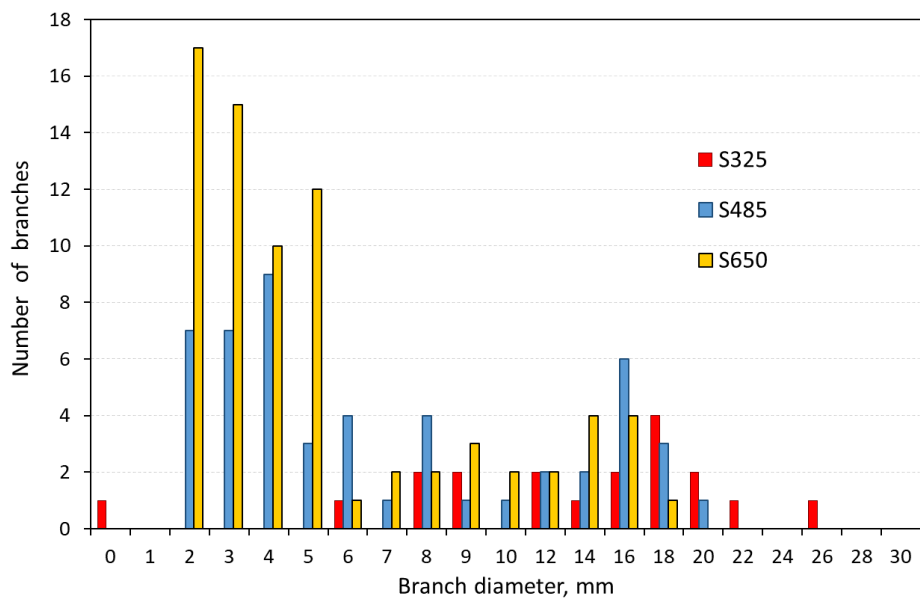
Figure S3. Vertical profiles of snow specific surface area and density measured at an open spot similar to FIELD and at a spot in shrubs similar to SHRUB on April 5th 2021.

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Figure S4. Branch size distribution of a representative shrub at the level of the three lowermost SHRUB sensors.

50 **Figure S5. Photograph taken on Bylot Island (73.17°N, 79.81°W) on 17 May 2015, at peak snow height, illustrating that in the Arctic, snow height usually does not extend beyond shrub height. The shrubs are 40 cm-high *Salix richardsonii*.**