Supplement of

Identification of rock and fracture kinematics in high alpine rockwalls under the influence of elevation

Daniel Draebing

Correspondence to: Daniel Draebing (d.draebing@uni-bayreuth.de)
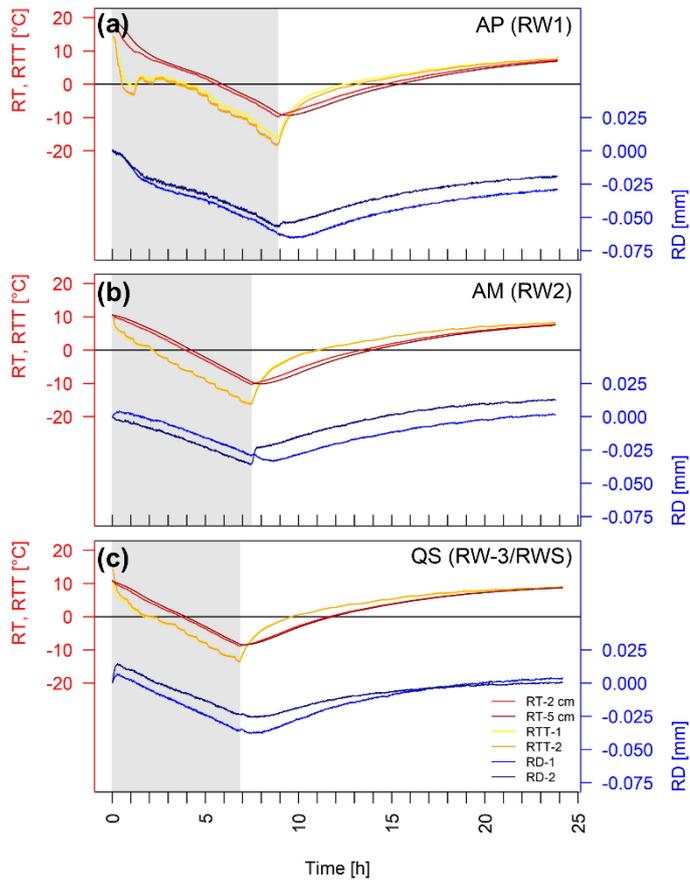
Figure S1: Laboratory crackmeter measurements of the (a) aplite, (b) amphibolite and (c) schistose quarts slate sample. Rock-top temperature (RTT), rock temperature (RT) and rock deformation (RD) of crackmeter 1 and 2 plotted versus time.
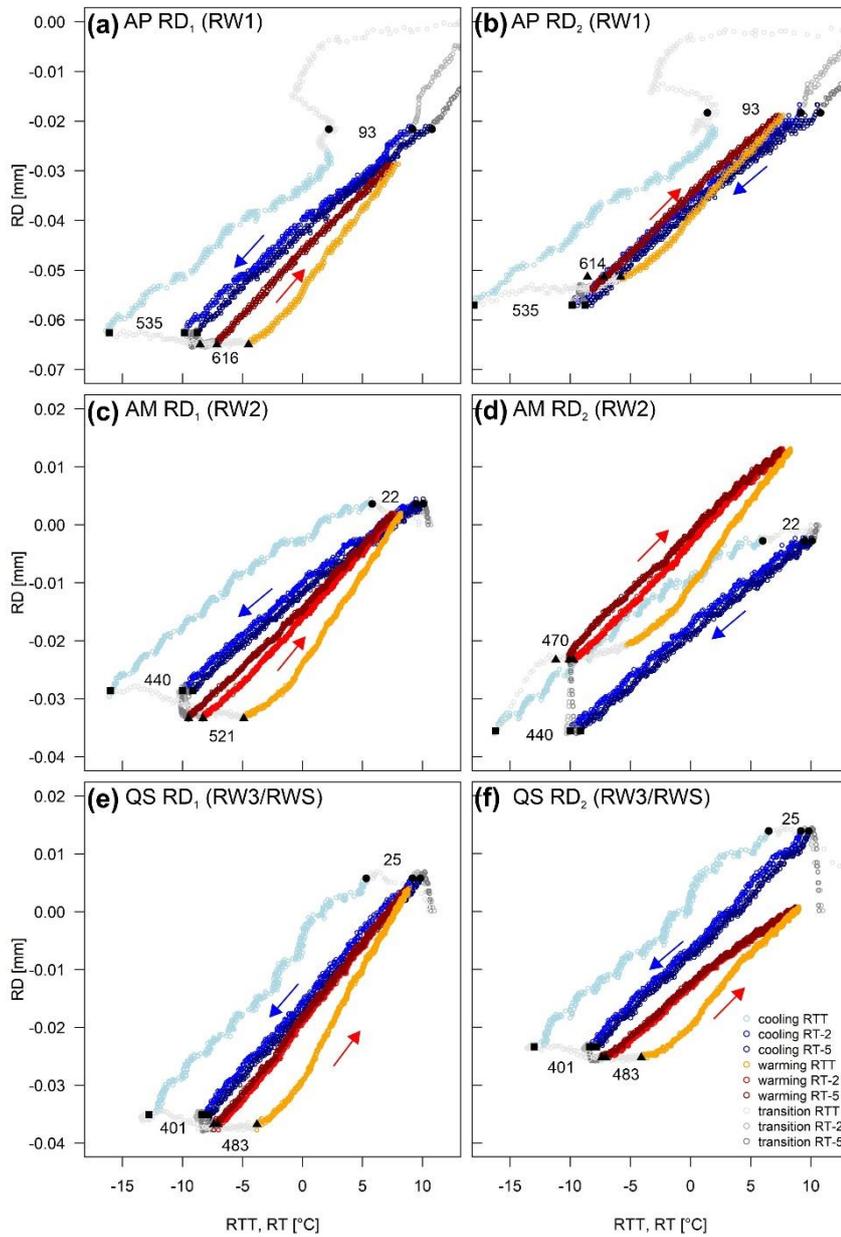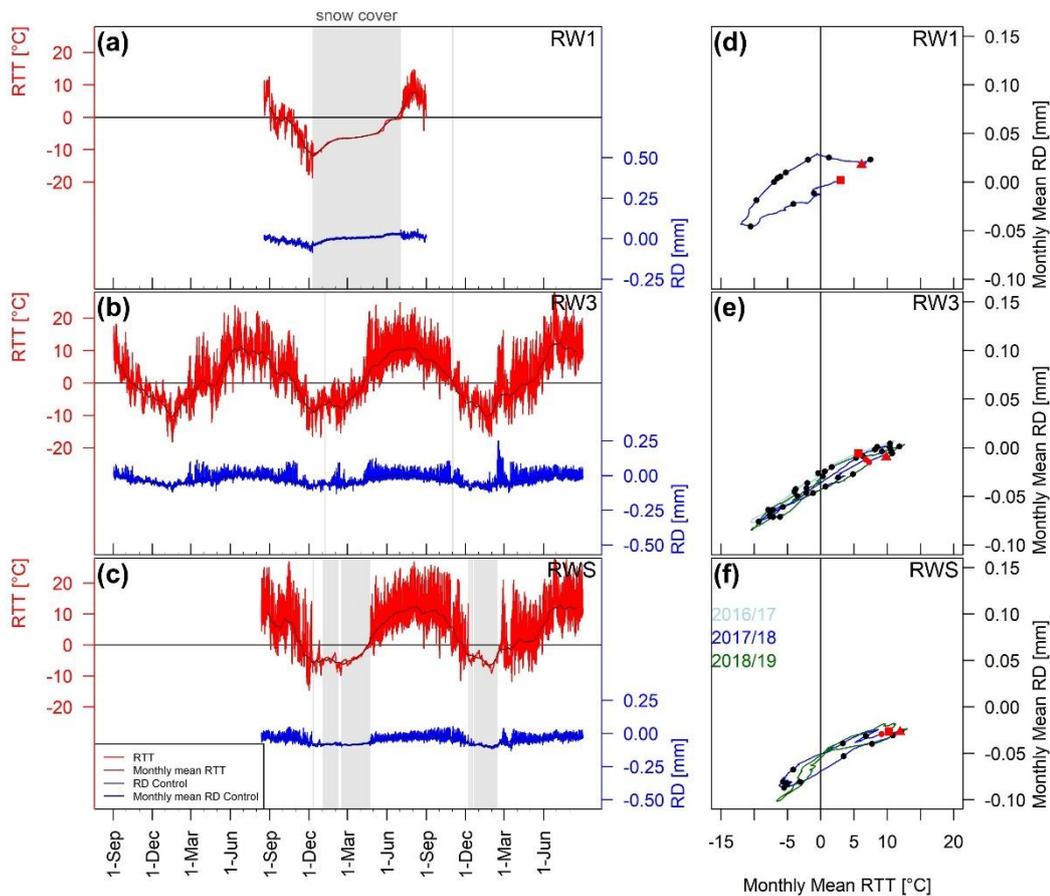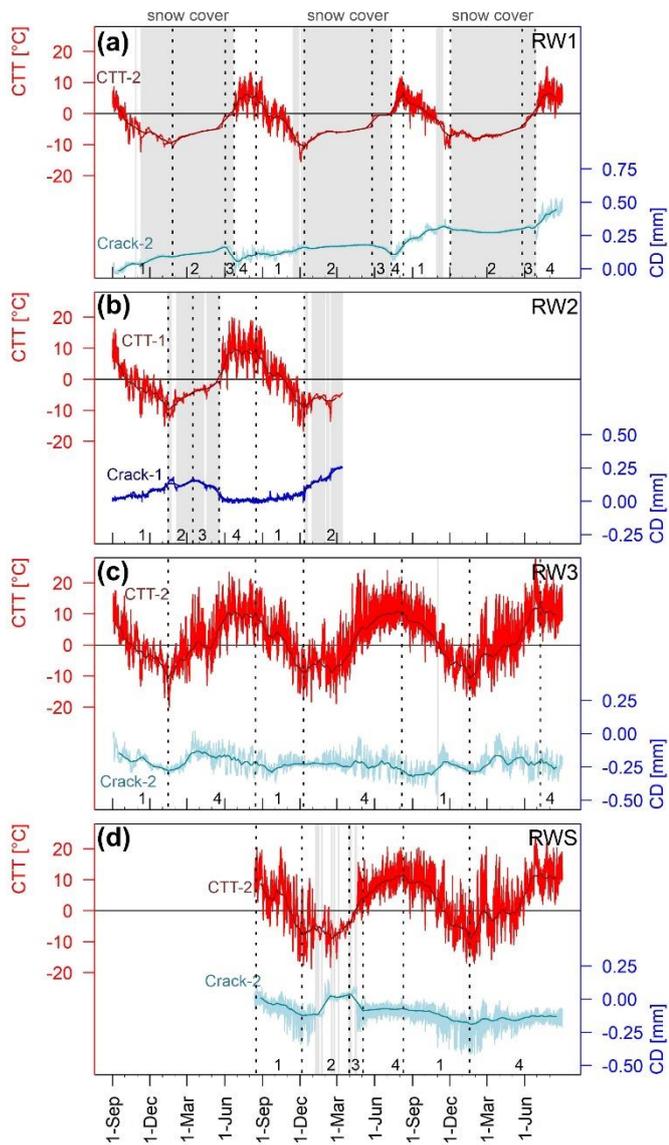
15

Figure S2: Laboratory crackmeter measurements of the (a-b) aplite, (c-d) amphibolite and (e-f) schistose quartz slate sample. Rock deformation of crackmeter 1 (RD$_1$) and 2 (RD$_2$) are plotted versus Rock-top temperature (RTT) or rock temperature (RT). Numbers indicate the timing of the beginning of the cooling period (black dot), end of the cooling period (black rectangle) and beginning of the warming period (black triangle). Arrows highlight the temporal trajectory of cooling (blue) and warming (red).
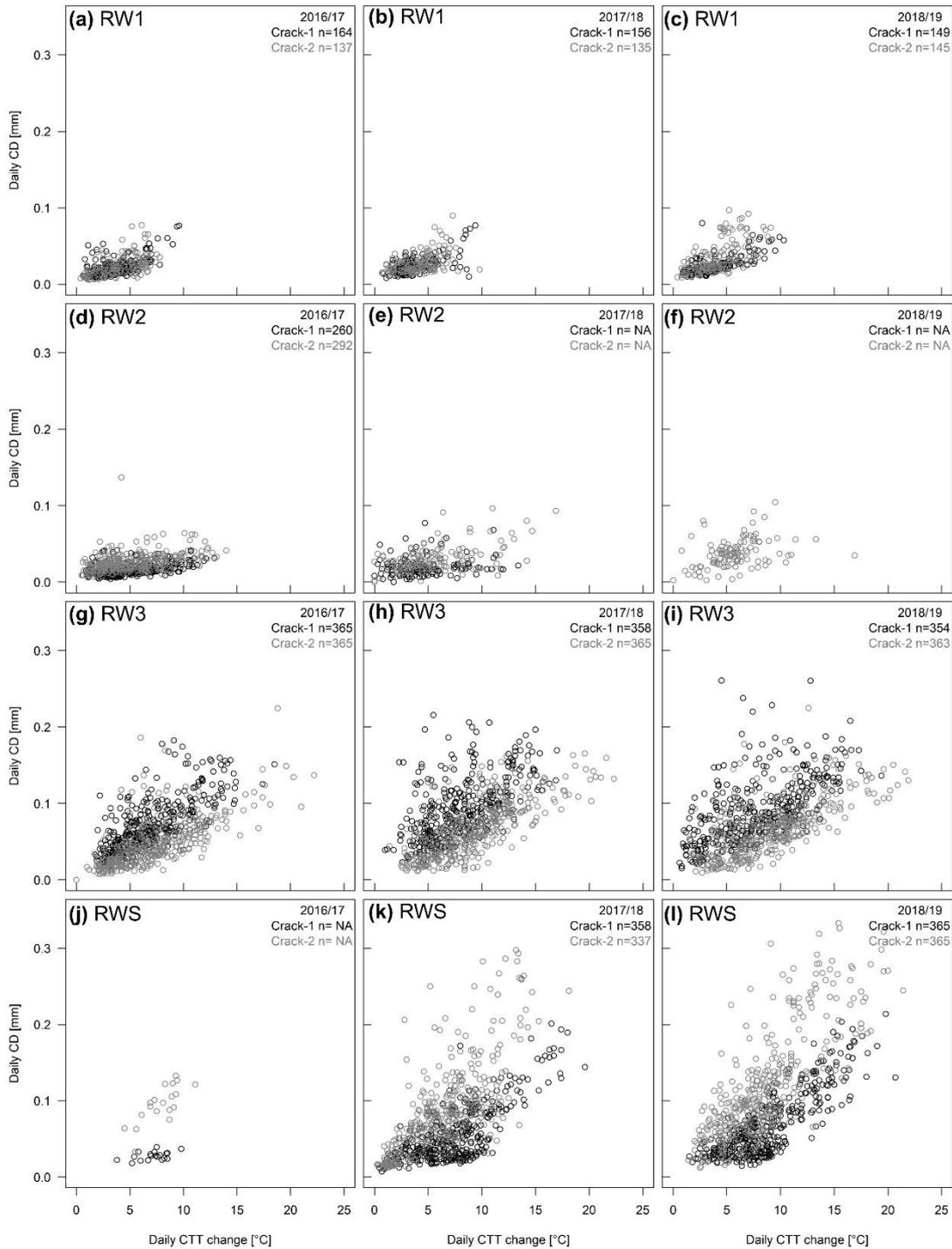
20

Figure S3: Field measurements of the control crackmeter at (a) RW1, (b) RW3 and (c) RWS. RTT (red line) and monthly mean RTT (dark red line), RD (blue line) and monthly mean RD (dark blue line) plotted versus time for the period from 1 September 2016 to 31 August 2019. Grey rectangles highlight the occurrence of snow cover. Monthly mean rock deformation plotted versus monthly mean RTT for control crackmeters at (d) TW1, (e) RW3 and (f) RWS. Red rectangles indicate start, black dots first day of a month, red dots the beginning of new measurement period and red triangles the end of measurements. Colour of graphs indicate data from 2016/17 (light blue), from 2017/18 (blue) and 2018/19 (green).

25

4

Figure S4: Crack-top temperature, monthly mean crack-top temperature, crack deformation and monthly mean crack deformation for the crackmeters at (a) RW1, (b) RW2, (c) RW3 and (d) RWS for the period 1 September 2016 to 31 August 2019. Grey rectangles highlight the snow cover period, while numbers indicate the interpreted phases (see Table 4).

Figure S5: Daily crack deformation plotted versus daily crack-top temperature for RW1 in (a) 2016/17, (b) 2017/18 and (c) 2018/19, RW2 in (d) 2016/17, (e) 2017/18 and (f) 2018/19, RW3 in (g) 2016/17, (h) 2017/18 and (i) 2018/19, and RWS in (j) 2016/17, (k) 2017/18 and (l) 2018/19. Numbers n indicate the number of daily cycles, NA highlights incomplete measurements during the period due to instrument failure.