Major increases projected in extreme surface melt events in Antarctica, even under a moderate emission scenario

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Surface Melt (SM) is one of the factors that contribute to sea level rise; surface meltwater draining through the ice and beneath Antarctic glaciers may cause acceleration in their flow towards the sea. Changes in the frequency of relatively warm days (including heatwaves) can substantially alter the SM variability, thus leading to extreme melting events. By using simulations from 13 Global Climate Models (GCMs) and according to a moderate representative concentration pathways (RCP4.5), here we show that the frequency of extreme SM events (SM90; according to the 90th percentile over the reference period 1961-1990) may significantly increase in coastal areas of West Antarctica; in particular in the Antarctic Peninsula. By the end of the century SM90 estimates are expected to increase from currently 0.10 kg/m\textsuperscript{2}/day to about 0.45 kg/m\textsuperscript{2}/day in the Antarctic Peninsula. Increments in SM90 estimates are not just driven by changes in the average SM, but also by the variability in SM. The latter is expected to increase by around 50\% in the Antarctic Peninsula.