Geophysical Research Abstracts
Vol. 13, EGU2011-5961, 2011
EGU General Assembly 2011

The changing melt regime of the Greenland ice sheet

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Output of a regional atmospheric climate model (1958-2009) is used to assess factors driving interannual melt variability on the Greenland ice sheet. Model performance is evaluated using melt data from automatic weather stations in the ablation zone in southwest Greenland. As expected for a polar ice sheet, interannual melt variability is predominantly driven by variations in shortwave radiation absorption. Sensible heat exchange plays an important role only in the lower ablation zone. But our analysis reveals a significant downward trend in the role of shortwave radiation variability over the last decades, suggesting a transition towards a Greenland melt regime that resembles that of ice caps in more temperate regions.