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Seasonal and Interannual Variations of Ice Sheet Surface Elevation at the Summit of Greenland: Observed and Modeled (Paperback)

By H Jay Zwally, Li Jun

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.Observed seasonal and interannual variations in the surface elevation over the summit of the Greenland ice sheet are modeled using a new temperature-dependent formulation of firn-densification and observed accumulation variations. The observed elevation variations are derived from ERS (European Remote Sensing)-1 and ERS-2 radar altimeter data for the period between April 1992 and April 1999. A multivariate linear/sine function is fitted to an elevation time series constructed from elevation differences measured by radar altimetry at orbital crossovers. The amplitude of the seasonal elevation cycle is 0.25 m peak-to-peak, with a maximum in winter and a minimum in summer. Inter-annually, the elevation decreases to a minimum in 1995, followed by an increase to 1999, with an overall average increase of 4.2 cm a(exp -1) for 1992 to 1999. Our densification formulation uses an initial field-density profile, the AWS (automatic weather station) surface temperature record, and a temperature-dependent constitutive relation for the densification that is based on laboratory measurements of crystal growth rates. The rate constant and the activation energy commonly used in the Arrhenius-type constitutive relation for firn densification...

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