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INSAR at ASF: Analysis of the 1993 Bering Glacier Surge

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Abstract

This talk will begin with a brief discussion of the development of SAR interferometry at the Alaska SAR Facility (ASF) and will proceed to an analysis of interferometrically derived data on the Bering Glacier. The Bering Glacier and its associated accumulation area, the Bagley Ice Field, are located in South Central Alaska in the Chugach-St.Elias Mountains. Together they comprise the largest temperate valley glacier in North America.
Differential SAR interferometry is applied to the Bagley Ice Field prior to and after the onset of a major surge event in the spring of 1993 using data from the two ERS-1 Ice Phases (early in 1992 and 1994). Variations in surface elevation and surface ice velocity in the quiescent accumulation area upstream of the catastrophically disrupted surging region are discussed in the context of surge mass balance estimation. The flow directions in the region of interest tend to run roughly in the cross-track direction but conversion of line-of- sight displacement over three day repeat-pass intervals to surface velocity vector fields is neverthe less problematical.
Attention is also given to the difficulties in analyzing low-coherence signals from temperate-climate glacier surface ice near the Gulf Coast of Alaska. Despite these obstacles, interferometry is providing high-resolution data input to the general problem of understanding the dynamic nature of this glacier system.
Keywords: