

HR: 15:35h
AN: U12C-08 INVITED
TI: Interferometric Imaging of Glacier Grounding Lines
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AB: Satellite radar interferometry from the ESA ERS-1 and ERS-2 instruments provided a quantum leap in our capability to characterize the surface velocity and topography of glacier and ice sheets over wide areas, at an unprecedented level of spatial details and precision. At the grounding line, where a glacier detaches from its bed and becomes afloat in the ocean, radar interferometry is able to detect the subtle flapping of the floating glacier tongue or ice shelf with changes in oceanic tide. The level of precision of the detection (mm level) permits a precise mapping (a few tens of m) of the grounding-line position, which is totally unprecedented. From the precise and repeatable mapping of the grounding-line position, we obtain information on: 1) the glacier surface two-dimensional flow vector; 2) the flux of ice into the ocean (ice thickness is deduced from hydrostatic equilibrium of the ice); and 3) the level of horizontal migration of the grounding line with time. This information, combined with other data, helps in turn determine the state of mass balance of the glacier, whether its grounding line is retreating or advancing, and how fast the glacier floating section melts in the ocean waters from the bottom. This approach has been used to discover the importance of basal melting in north Greenland and detect the fast retreat of Pine Island Glacier, a major ice stream of West Antarctica.
DE: 6924 Interferometry
DE: 1827 Glaciology (1863)
SC: U
MN: 1998 Fall Meeting