

HR: 14:00h
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TI: Basal Melting and Mass Balance Of Antarctic Glaciers Derived
from ERS SAR Interferometry
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AB: Synthetic-aperture radar data collected by the ERS-1 and 2
satellites are used to measure the ice velocity, topography
and grounding-line position of several major Antarctic
glaciers, which include Evans Ice Stream, Carlson Inlet,
Rutford Ice Stream, Pine Island Glacier, and Thwaites
Glacier in West Antarctica, and David Glacier, Mertz Glacier
and Lambert Glacier in East Antarctica. Ice thickness is
estimated from prior-determined ERS radar altimetry data
assuming hydrostatic equilibrium of the ice. Mass flux at
the grounding line is calculated and compared with
prior-determined accumulation in the interior to conclude
on their state of mass balance. Most glaciers appear
to be closer to a state of mass balance than inferred from
previous studies, especially in the case of Pine Island
Glacier and Lambert Glacier. Earlier estimates were
underestimated because they did not account for the
possibility of strong basal melting near the grounding line.
Basal melting is here inferred from the calculated decrease
in mass discharge downstream of the grounding line. The
inferred rates are large near the grounding line, up to
50 m/yr in Pine Island Bay. The large magnitude of these
melt rates means that changes in ocean conditions
(temperature profile, currents, global circulation) exert
significant control on the future evolution of these glaciers.

DE: 6924 Interferometry
DE: 1827 Glaciology (1863)
SC: H
MN: 1998 Fall Meeting