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Accumulation rates from 38 ka and 160 ka radio-echo sounding horizons in East Antarctica

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The internal layering architecture of ice sheets, as detected with radio-echo sounding (RES), contains clues to past ice-flow dynamics and mass balance and supplies flow models with starting and boundary conditions.

In comparison to the Greenland Ice Sheet, the coverage of the East Antarctic Ice Sheet with information on internal ice structure is still sparse.

This hampers the constraining or initialization of ice-flow models with geometry and surface mass balance data in adequate resolution.

We traced two RES horizons, 38 ka and 160 ka, over great parts and in the most remote areas of the East Antarctic Ice Sheet.

We dated the horizons at the EPICA Dome C Ice Core and followed them along RES lines of the Alfred Wegener Institute to Vostok and Dome A.

There, they could be connected to the RES grid, covering the Gamburtsev mountains, that was collected as part of the AGAP (Antarctica's Gamburtsev Province) project, and continued to South Pole.

From this widespread age-depth distribution we reconstruct mean accumulation rates and analyze spatial variations in surface mass balance, as well as differences between the two time periods.