

## **Past Flow Conditions of Thwaites Glacier revealed by radar-detected internal layer patterns**

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We use radar-detected internal layer patterns from the Airborne Geophysical Survey of the Amundsen Sea Embayment (AGASEA) project to characterize past flow conditions of Thwaites. We compute the roughness of internal layers and bed and compare them with each other. In general, the bed is rougher than the internal layers in slow-flow regions (divides) while in fast-flow regions (outlet glaciers) the internal layers are rougher than the bed. In slow-flow regions, the internal layers are a muted reflection of the bed topography. In fast flow regions, the greater roughness of internal layers is due to features inherited from upstream. The inherited patterns can be tracked between radar layers roughly perpendicular to the ice flow, particularly in the onset regions where ice velocities are 50-150 m/a. The distinct patterns define individual flow bands and will be used to determine the ratio of paleoflow velocities for the past ~500-1000 years (the transit time of ice through areas where patterns can be tracked).