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A modelling approach to understand ice sheet isochrone architecture from basal ice accretion

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Large scale subglacial ice accretion features have recently been observed in radio echo sounding data in both Antarctica and Greenland. Such observations are combined with a time-dependent model capable of calculating tracers and isochrone layers within the ice, in order to explore their genesis and test their suitability to infer long term history of subglacial conditions. This combined approach allows determination of whether such an accretion process is actively happening, and its age relative to the average accumulation rates. Inferred basal accretion rates are of the order of magnitude of surface accumulation rates. Considering the spatial extents of such features, they may provide a significant, but currently neglected, contribution for the mass balance of an ice sheet.