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Greenland ice structure from CReSIS englacial radar reflection data

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First results from a complete automated processing of the englacial CReSIS Greenland airborne radio-echo soundings dataset are presented. We extract available isochrone dip information from the CReSIS flight data. Two automated processing methods are applied. The first method uses automated image recognition techniques to measure localised reflector dip (Sime et al. 2011). The second method attempts to cross-match individual radar profiles (Lisiecki and Lisiecki, 2002); here applied to several million radar profiles. The methods used are computationally intensive, and required the use of extensive parallel computer resources. Results from these two different methods are cross-tested, providing an initial evaluation of the new CReSIS-ASGARD project englacial structure dataset (NE/J004804/1), and yielding information about uncertainties on the measurements.

The resultant CReSIS-ASGARD dataset is one of the first continental-scale datasets which shows the englacial ice structure across the Greenland ice sheet. The study and dataset may be of use in the investigation of: Greenland ice flow dynamics; the evaluation of icesheet model simulations; and the assessment of past rates of snow accumulation.