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Clast fabric patterns in subglacial bedforms from contemporary and palaeo glaciers

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Linear subglacial bedforms such as flutes, drumlins and mega scale glacial lineations are common to the basal environment of many glaciers. These bedforms document the direction of ice flow and could contain significant information about subglacial processes. In this study contemporary and palaeo subglacial bedforms are examined in order to investigate the role of particle fabric in preserving a signal of subglacial processes and dynamics. Particle fabric is considered a useful sediment property to investigate because it may reveal information about the nature and intensity of strains imposed upon a till. Previous research has revealed differences in fabric patterns between different size ranges of particles, however it is uncertain whether this occurrence relates in any way to sediment strain. Particle fabrics were measured and analysed for different size fractions from (a) a flute which had recently emerged from the retreating terminus of Breidamerkurjökull, Iceland; and (b) two drumlins from the bed of the palaeo Tweed Ice Stream, Scotland.

Results indicate the strain response of different sized particles and allows inference of the particle rotation mechanisms which operated within these tills. This study demonstrates the variability of particle fabric across small spatial scales and highlights the importance of a robust sampling strategy when measuring particle fabric in a till. Comparison between these two types of linear bedform also provides a useful insight into the issue of spatial scale.