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## The upper 2121 m at EastGRIP - Results from physical properties of NEGIS

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Here we present the ice microstructure and CPO (c-axes fabric) data from the upper 2121 m of the EastGRIP ice core, an on-going deep drilling project on the North East Greenland Ice Stream. Understanding ice flow behaviour of fast flowing ice streams is crucial for accurate projections of future global sea level rise, but is still poorly understood due to e.g. missing observational fabric data from ice streams.

The presented CPO patterns found at EastGRIP show (1) a rapid evolution of c-axes anisotropy compared to deep ice cores from less dynamic sites, (2) a CPO evolution towards a strong vertical girdle and (3) CPO patterns that have not previously been directly observed in ice. Furthermore, data regarding grain properties (e.g. grain size) and indications of dynamic recrystallization, already at shallow depths, are presented.

The ice CPO shows a clear evolution with depth. In the first measurements at 111 m depth a broad single maximum distribution is observed, which transforms into a crossed girdle CPO (196-294 m). With increasing depth, an evolution towards a vertical girdle c-axes distribution occurs. Below 1150 m the CPO evolves into a vertical girdle with a higher density of c-axes oriented horizontally, a novel CPO in ice. These CPO patterns indicate a depth-related change in deformation modes, from vertical compression to extensional deformation along flow.

Grain size values are similar to results from other Greenlandic deep ice cores. Grain size evolution is characterized by an increase until 500 m depth, a decrease until 1360 m depth and mainly constant values in the Glacial. These findings are accompanied by indications of an early onset of dynamic recrystallisation e.g. irregular grain shapes, protruding grains and island grains.

The presented high-resolution data enable, for the very first time, a detailed and data-based look into a fast-flowing ice stream and are an important step towards a better understanding of the rheology of ice and its flow behaviour.