

EGU2020-1173

<https://doi.org/10.5194/egusphere-egu2020-1173>

EGU General Assembly 2020

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## Complex basal conditions influence flow at the onset of the North East Greenland Ice Stream

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The onset and high upstream ice surface velocities of the North East Greenland Ice Stream (NEGIS) are not yet well reproducible in ice sheet models. A major uncertainty remains the understanding of basal sliding and a parameterization of basal conditions. In this study, we assess the slow-flowing part of the NEGIS in a systematic analysis of the basal conditions and investigate the increased ice flow. We analyze the spectral basal roughness in correlation with basal return power from an airborne radar survey with AWIs ultra-wideband radar system in 2018 and compare our results with current ice flow geometry and ice surface flow. We observe a roughness anisotropy where the ice stream widens, indicating a change from a smooth and soft bed to a harder bedrock as well as the evolution of elongated subglacial landforms. In addition, at the upstream part of the NEGIS we find a clear zoning of the bedrock return power, indicating an increased water content at the base of the ice stream. At the downstream part, we observe an increased bedrock return power throughout the entire width of the ice stream and outside its margins, indicating enhanced melting and the distribution of basal water beyond the shear zones.

**How to cite:** Franke, S., Jansen, D., Paden, J., and Eisen, O.: Complex basal conditions influence flow at the onset of the North East Greenland Ice Stream, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-1173, <https://doi.org/10.5194/egusphere-egu2020-1173>, 2019