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Modelling calving at Kronebreen, Svalbard using Elmer/Ice

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Understanding how tidewater glaciers are responding to climatic and oceanographic changes is vital in order to reduce uncertainty in sea level rise estimates. In this project, we are using the 3D calving model in Elmer/Ice to simulate how Kronebreen responds over short time scales to various forcing scenarios. Specifically, a variety of frontal melt scenarios are being implemented to understand how calving and glacier dynamics respond to changing inputs. Both the magnitude and spatial distribution of frontal melt will be varied, with these scenarios being informed by a dataset of glacier proximal water temperatures (spanning Aug 2016 – Aug 2017) as well as by plume locations as identified from satellite imagery. The model output will be compared to observational data (frontal position, velocities) collected for the period 2016 – 2017 with the aim of running longer simulations using a 'best fit' model set up. Details of the experimental set up, as well as some preliminary results, are presented here.