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# Ground based interferometric radar for velocity and calving rate measurements of the tidewater glacier Kronebreen, Svalbard, from August 2007 and 2008.

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We here present flow velocities of Kronebreen calving front measured with a ground based high range resolution interferometric radar at a high temporal rate (2 Hz) during a week in August 2007 and 2008. The radar, operating at 5.75 GHz, is located approximately 4 km from the calving front. The radar measures a horizontal width of $\tilde{7}$00 m of the front, and a range of 300 m. The latter includes the calving front and 250 m up-glacier. Video images are recorded to identify calving events and to aid in the interpretation of the radar data. We find that the glacier surface provides permanent scatterers, so spatially continuous movements at the front and at locations further up-glacier can be tracked. Calving events can also be identified in the radar data. For an $\tilde{8}$ hours survey in 2007 we measure a large increase in velocity at the calving front and extending 30 m up-glacier, while further up-glacier the velocity is stable ($\tilde{2}$.5 md-1) during the entire period. Two large calving events are identified during this $\tilde{8}$ h survey, removing 25 m of ice in the radar range direction normal to the ice front. The velocity of the front slows to a stable 2.5 md-1 after the events. During another data series in 2007 the velocities are stable ($\tilde{2}$.5 md-1) and no calving events are identified. The data from 2008 has yet to be processed, but preliminary results show a velocity of 3.2 md-1. The method is promising for carrying out studies of processes at a calving front, as it provides spatially continuous, high frequency accurate velocities from a safe distance to the glacier.