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Glaciological investigations of the dynamics of the Fimbulisen ice shelf

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We show the first results from the 2009-2010 summer season glaciology field campaign on Fimbulisen, the largest iceshelf in Dronning Maud Land (DML), Antarctica. The iceshelf is fed by Jutulstraumen, the largest outlet glacier from DML, and it plays an important role in processes in the Weddell Sea area.

Previous modeling and remote sensing studies imply that Fimbulisen has a strong negative mass balance. The total basal mass loss was estimated to be the largest of all the ice shelves around Antarctica. However, themost recent measurements under the ice shelf indicate that the basal melt rates are overestimated and in fact, the ice shelf may be in equilibrium.

Our profile of the basal topography measured with a phase sensitive radar gives meter scale accuracy along the length of the floating part of Jutulstraumen. An estimate of basal melting and velocity fields is made from individual stationary radar measurements, and mass balance stakes with an approximate 2 week time lapse. These results give insight into the seasonal state of the ice shelf, whilst the total mass balance will be obtained after the repeat measurements of 2010-2011.