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The 2010 summer expedition to Freya glacier (Clavering Island, NE-Greenland)

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To analyze climate change impacts on the energy and mass balance of arctic glaciers, an expedition to Freya glacier has been undertaken in August 2010. The Expedition has jointly been planned, organized and carried out by the Department of Geography and Regional Science (University of Graz, Austria) and the Central Institute for Meteorology and Geodynamics (ZAMG) (Vienna, Austria). Freya glacier is a small valley glacier ($\sim$ 6 km2) in the north of Clavering Island (NE-Greenland) that has been chosen as a test site as it is well accessible using the Zackenberg Research Station as a nearby base station. A further argument for chosing this glacier as our test site is the fact that mass and energy balance measurements are available at Freya glacier as a result of a glacier mass balance monitoring program recently initiated by the ZAMG in the framework of the „International Polar Year 2007/2008“ and as a result of previous studies carried out in the years 1939 - 1940 by W. Ahlmann (Swedish glaciologist, Stockholm University). Furthermore, Freya glacier has a terminated accumulation area and no contact with the inland ice shield which facilitates mass-balance monitoring. The main purpose of our expedition was i) to extend the existing meteorological station network in the Freya glacier area, ii) to measure the mass balance of the glacier as done by the ZAMG in the precedent years, and to iii) gather information on glacier albedo and snow/ice density as required to adequately parameterize the model AMUNDSEN. The latter is applied to simulate the snow accumulation, distribution, sublimation and surface melt attempting to improve the simulation of glacier recession and freshwater influx into the ocean under current and potential future climate conditions. In our poster we give a short overview of our activities at Freya glacier in the year 2010 including a presentation of the data collected in the field (e.g. mass balance, albedo measurements). Further, preliminary results achieved with the AMUNDSEN are discussed and compared to previous studies by W. Ahlmann carried out in the years 1939 - 1940.