Idea389

Grounded ice discharge of the Antarctic ice sheet

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Target.
To estimate the current ice discharge of the Antarctic ice sheet and its changes over the last 50 years (1957-2007) based on data management and analysis of information available on ice thickness and velocity near grounding zone and changes of the coastal line of Antarctica.

Brief content.
The knowledge on regime and evolution of Antarctic Ice Sheet is of high priority for understanding the problem of global climate change which is very critical at the moment. The sea level changes among others depend on the state of Antarctic Ice Sheet and, in particular, on the processes which occur in the different parts of the ice sheet. Antarctic Ice Sheet plays an important role in the global climate and therefore reflects the climate changes that closely link to interactions within the ice sheet – ocean – atmosphere system. Existing cognizance on the current state of Antarctic Ice Sheet and possible scenarios of its evolution are not satisfactory. At the moment it is very problematic to forecast the changes in regime of Antarctic Ice Sheet even for few future decades that might be very critical for the future of our planet. The mass balance is one of the most important indicators of the state and regime of Antarctic Ice Sheet. Being the lager part of the total runoff of Antarctic Ice Sheet, the discharge of the grounded ice reflects the main tendencies in the negative part of its mass balance. The review of the estimations existed on grounded ice discharge of the whole Antarctic Ice Sheet have showed considerable differences in the values which can be explained as the result of various technologies used.

Planned result
The current grounded ice discharge for main drainage basins of Antarctic ice sheet as well as changes in discharge since the beginning of the observations for each basin will be evaluated.
It will allow to reconstruct the dynamics of ice discharge of the whole Antarctic ice sheet in the II half of the past century. The results obtained planned to be organized in the data base.

Planned studies.
To collect and analyze the data available on ice velocities and thickness near grounding line of main outlet glaciers and ice streams of Antarctic ice sheet since first observations until present.
To estimate the ice velocities and identify grounding line position both from optical and radar satellite images and ground based measurements.
To determine the ice thickness near grounding line using data available on airborne and ground based remote sensing measurements.

Planned field activities
2005 – 2008 гг. Ground based measurements on ice velocity and thickness near grounding line of Entuziasty Glacier (as a part of SCAR supported IDEA project)