

THE ANTARCTIC GRAVITY FIELD: STATUS, IMPROVEMENTS AND PROSPECTS OF THE INTERNATIONAL POLAR YEAR

M. Scheinert¹, A. Capra², R. Dietrich¹, J. Müller¹

¹*TU Dresden, 01062 Dresden, Germany,* ²*Universita di Modena e Reggio Emilia, 41100 Modena, Italy*

The geodetic task of the determination and improvement of the Antarctic gravity field is closely linked to the goals of the SCAR GIANT sub-working group on "Physical Geodesy" and of the IAG Commission Project 2.4 "Antarctic Geoid". Despite the geodetic view of the gravity field in Antarctica, there is a variety of implications also to neighbouring disciplines like geophysics and glaciology.

The determination of the global gravity field has being widely improved by the utilization of the new satellite gravity missions CHAMP and GRACE. While GRACE delivers the time-variable field, the upcoming GOCE mission will even further improve the static part of the gravity field.

In Antarctica, the observation of the gravity field still lacks coverage (due to the polar gap) and resolution (due to the limitations of the satellite methods). The paper will review the status of terrestrial and airborne gravity observations, which will be helpful to densify and improve the gravity field in Antarctica.

The research work on regional geoid improvement will be discussed while presenting recently calculated models for selected areas in Antarctica. An improved regional geoid will contribute to further investigations in geodesy, geophysics and oceanography (e.g. for investigating ice shelves or determining the transition zone between continental and oceanic crust).

Finally, the paper will summarize the progress in gravity field research in Antarctica to be expected in the upcoming International Polar Year 2007/08. oceanic crust).

Finally, the paper will summarize the progress in gravity field research in Antarctica to be expected in the upcoming International Polar Year 2007/08.