Improvement of the University of New Brunswick's gravimetric geoid model in Canada

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The latest gravimetric geoid for Canada produced by UNB in the year of 2000 was based on the Stokes-Helmert's solution. This model shows rather large discrepancies, of the order of several decimeters, compared to the GPS/levelling derived geoidal heights in the Rocky Mountains. An intensive effort to improve the accuracy of the UNB model was undertaken during the past year, and three major problems of technical nature have been identified. These were: the proper approach used for the preparation of the mean gravity anomalies on a regular geographical grid, the proper application of a spherical model to topographical effects and the proper downward continuation of Helmert's gravity anomalies from the earth surface to the geoid. The problems and their remedies will be discussed.

As the largest errors in the 2000 model appeared in mountainous regions, the Canadian Rocky Mountains, with peaks reaching over 4000 meters, were chosen as the "proving ground". The improved model will be presented and the fit to the GPS/levelling derived geoidal heights will be shown.