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EVALUATION OF TERRAIN CORRECTIONS THROUGH FFT AND CLASSICAL INTEGRATION IN TWO SELECTED AREAS OF THE ANDES AND THEIR IMPACT ON GEOIDAL HEIGHTS

Avaliação das correções do terreno através da FFT e da integração clássica em duas áreas selecionadas dos Andes e do seu impacto sobre a altura geoidal

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ABSTRACT

As part of the regional geoid modeling, terrain corrections were computed in Tierra del Fuego island and in the west side of the province of Mendoza. The first place is located in the southernmost region of Argentina and Mendoza is in the center-west of this country. Considering both study areas, elevations range from 0 m to 6500 m. The classical integration of prism contribution and the 2-D FFT technique were used to estimate terrain corrections. This study aims at discussing the results obtained by both approaches and their applicability considering their advantages and disadvantages according to the regions under investigation. The analysis allowed us to conclude that classical integration has a better performance than FFT methods, especially in the highest regions where terrain corrections can be overestimated in more than 20 mGals by FFT. Both techniques described show similar results in flat areas. Finally, the effect that the error of terrain corrections computation has on geoidal heights is also discussed and numerically tested. It is proved that an error in gravity anomalies of 20 mGals may cause up to 2 m geoid height error.

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