Geoid Model and Altitude at Mount Aconcagua Region (Argentina) from Airborne Gravity Survey - DTU Orbit (08/11/2017)

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Aconcagua is part of the Southern Andes in the Argentine Province of Mendoza and it is the highest mountain in the Americas. The Aconcagua region is mostly inaccessible for land surveys. The existing gravity data are sparsely distributed, and mainly along the route currently used to climb the mountain. Gravity data are needed for applications such as geoid modeling, vertical datum determination and geological study. In 2010, a high-altitude survey (between 7,000 and 8,000 m above sea level), covering the entire area of Aconcagua was performed. This survey was done within the framework of IAG Project "Gravity and Geoid in South America". Free Air anomalies were computed and compared to Earth Gravitational Model 2008 (EGM08), degree 2190 at the flight altitude. The residuals can be attributed to the fact that the airborne data carries a lot of new gravity information not represented in the EGM08 model. A geoid model was computed from those airborne gravity anomalies and land gravimetry data. A remove-restore method was used for terrain and global spherical harmonic reference models, with the residual gravity field signal downward continued by least-squares collocation, and the geoid and quasi-geoid computed by spherical Fourier methods. The N value at Aconcagua's summit was combined with the ellipsoidal height observed at the summit GPS station to obtain the orthometric height above sea level, confirming the most recent triangulated summit height of 6,960 m.

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