



Gravity and geoid model for South America

Denizar Blitzkow (1), Ana Cristina Oliveira Cancoro de Matos (1), Gabriel do Nascimento Guimarães (2), María Cristina Pacino (3), Eduardo Andrés Lauría (4), Marcelo Nunes (5), Carlos Alberto Correia e Castro Junior (5), Fredy Flores (6), Nuris Orihuela Guevara (7), Ruber Alvarez (7), and José Napoleon Hernandez (7)

(1) Universidade de Sao Paulo, Dept. of Engineering Transport, Sao Paulo, Brazil (dblitzko@usp.br), (2) Universidade Federal de Uberlândia, Faculdade de Artes, Instituto de Geografia, Brasil (gabriel@ig.ufu.br), (3) Facultad de Ciencias Exactas, Ingeniería y Agrimensura (FCEIA), Universidad Nacional de Rosario, Argentina (mpacino@fceia.unr.edu.ar), (4) Instituto Geográfico Nacional, Argentina (elauria@ign.gob.ar), (5) Instituto Brasileiro de Geografia e Estatística (IBGE), Brasil (marcelo.nunes@ibge.gov.br), (6) Instituto Geografico Militar, Ecuador (fredy.flores@mail.igm.gob.ec), (7) Instituto Geografico Venezuelano Simon Bolivar (IGVSB) (nurisorihueiaigvsb@gmail.com)

In the last 20 years, South America Gravity Studies (SAGS) project has undertaken an ongoing effort in establishing the fundamental gravity network (FGN); terrestrial, river and airborne relative gravity densifications; absolute gravity surveys and geoid (quasi-geoid) model computation for South America. The old FGN is being replaced progressively by new absolute measurements in different countries. In recent years, Argentina, Bolivia, Brazil, Ecuador, Paraguay and Venezuela organizations participated with relative gravity surveys. Taking advantage of the large amount of data available, GEOID2015 model was developed for 15°N and 57°S latitude and 30 ° W and 95°W longitude based on EIGEN-6C4 until degree and order 200 as a reference field. The ocean area was completed with mean free air gravity anomalies derived from DTU10 model. The short wavelength component was estimated using FFT. The global gravity field models EIGEN-6C4, DIR_R5 were used for comparison with the new model. The new geoid model has been evaluated against 1,319 GPS/BM, in which 592 are located in Brazil and the reminder in other countries. The preliminary RMS difference between GPS/BM and GEOID2015 throughout South America and in Brazil is 46 cm and 17 cm, respectively. New activities are carrying out with the support of the IGC (Geographic and Cartographic Institute) under the coordination of EPUSP/LTG and CENEGEO (Centro de Estudos de Geodesia). The new project aims to establish new gravity points with the A-10 absolute gravimeter in South America. Recent such surveys occurred in São Paulo state, Argentina and Venezuela.