

Modélisation gravimétrique 2D et 3D du substratum rocheux des vallées alpines

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The determination of the bedrock shape and depth in alpine valleys is important in studies related to geological mapping, glacial geology, geothermal research, geotechnics or hydrogeology. Within this concept, the gravimetric study of alpine valleys supply significant contributions to geological mapping and a better understanding of the Quaternary geological phenomena in these areas. This work emphasizes the aspect of regionalization of information which gravimetry can donate to relatively localized geological and geophysical studies. It also analyzes different methods of gravity modeling and, thanks to the possibility of application in various geological and geographical situations, it examines the advantages and disadvantages of each methods. Finally it indicates possible solutions to gravity modeling problems that are related to applications in alpine valleys.

Three gravity case studies are presented. The study of the Lobbia glacier enables the testing of gravity modeling of a Quaternary fill in a favorable conditions with regard to the gravimetric parameters. The study of the Adige valley provides the means to solve, in a detailed geological context, problems related to the calibration of the regional anomaly and the choice of densities. Finally, with the application of 2D and 2.5D gravity modeling along 60 profiles at 2 km intervals, the geometry and the shape of the rock substratum along the Rhone Valley between Villeneuve and Brig are proposed in the form of substratum map and sediments thickness map.