

Comparison of Normal-orthometric Height and Helmert orthometric Height in Korea

Yong Lee, Joong-hee Han and Jay Hyoun Kwon (Republic of Korea)

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SUMMARY

The normal-orthometric height system has been published and used in Korea. Since 70 percent of Korean territory is covered with mountains, this height would differ from physical plumb line in many parts of the country. The reason is that this height system considers the effect of gravity from ellipsoid, not from actual gravity data. Nowadays it is possible to calculate the orthometric height, which considers the effect of actual gravity. In this study, in order to analyze the effect of terrain, normal-orthometric height and orthometric height are determined and compared using gravity and leveling data at the bench marks. Gravity data and leveling data, obtained when KNGeoid(Korean National Geoid Model) and vertical network were developed respectively, are used. Unfortunately, it is hard to determine the rigorous orthometric height because average gravity value along the plumb line exists under the ground. Therefore, the orthometric height is calculated by Helmert's approximation formula, called Helmert orthometric height, which converts gravity value surveyed on the surface to average gravity value along the plumb line. As a result, the gap between calculated normal-orthometric height and Helmert orthometric height is bigger in the area where mountains are dominant.