



About calculation of the components of the deflection of the vertical through discrete linear transformations

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At present, we can determine the components of the deflection of the vertical from gravity disturbances thanks to the development of GNSS-technologies. Therefore in our work, the components of the deflection of the vertical are defined by the Vening Meinesz' GNSS integral. A flat approximation is usually used while calculating the components of the deflection of the vertical in the central zone (with a size of up to one degree). If the size of the central zone increases the flat approximation does not provide satisfactory accuracy. So to keep the accuracy and enlarge the size of the central zone a modified kernel of the Vening Meinesz' GNSS integral that makes it possible to take into account a spherical Earth is developed. The Vening Meinesz' GNSS integral is the integral of convolution and discrete linear transformations can be applied for its evaluation. These transformations are especially effective if the analytical image of the kernel whose integral is to be calculated is known. The paper describes the deriving of the analytical image of the kernel developed for the Vening Meinesz' GNSS integral. A comparison of calculation results of the components of the deflection of the vertical in the zone with a size of up to ten degree, obtained by different methods is given.

Key words: Vening Meinesz' GNSS integral, the analytical image of the kernel.