IMPACT OF ATMOSPHERIC LOADINGS ON THE RESULTS OF GNSS MONITORING OF MAIN BUILDING OF ZAGORSKAYA PSPP-2 BY PPP METHOD

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The possibility of using the Precise Point Positioning (PPP) method in the system of integrated monitoring of hydraulic structures is study. Example of measurements in the system of monitoring the Zagorskaya PSPP-2 is shown. The absolute values of the coordinates of monitoring points determined by the PPP method are quite strongly affected by atmospheric loads arising from changes in atmospheric pressure. According to theoretical studies, vertical displacements due to this effect can be up to 25 mm, horizontal up to 1/3 of this value. The results of comparative analysis are obtained and the conclusions are done. The average daily values of the PS34 monitoring station coordinates calculated by the PPP method in the TropoGNSS software product are highly correlate with the series of crustal deformations in the area of Zagorskaya PSPP-2, calculated using the International Mass Loading Service online service, and the vertical coordinate is more correlated with the model data than the horizontal coordinates. Variations in the average daily values of the coordinates of the monitoring station allow us to identify crustal deformations of the order of 5 mm. This indicates a relatively high accuracy of the results of the PPP method and the need to apply external models of atmospheric loads. The use of external models of atmospheric loads can to ensure the required accuracy of observations of vertical and horizontal displacements of concrete dams by the PPP method.

Key words: Zagorskaya PSPP-2, hydraulic structures, automated monitoring, GNSS, atmospheric loads, PPP, TropoGNSS.

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