

Assessment of the Accuracy and Reliability of GNSS Measurements in RTK Mode, Performed with Inclined Pole, Applying Fuzzy Logic

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SUMMARY

Satellite navigation systems are subject of continuous significant improvements, which reflects on the quality and reliability of the geodetic measurements, done with contemporary equipment.

The overall quality of the results from the satellite measurements is a topic of significant importance to be discussed, especially when the case is about geodetic activities, performed in specific conditions.

Nowadays, a number of producers of GNSS equipment provide hardware to the end user, able to perform measurements via inclined pole. This technical ability opens new horizons for the geodesists. The possible applications are significantly increased, where geodetic measurements could be conducted in this way.

This paper studies the quality results from GNSS measurements, done in RTK mode, performed via inclined pole and assesses them applying Fuzzy logic. The quality criteria, calculated by the GNSS system were treated as input data in a geodetic software - Vienna_fuzzy (for assessment of the overall quality of geodetic measurements and determinations). In the field a number of measurements were conducted to ensure the redundancy of the gathered data.

In this specific case the input parameters in the application for assessment of GNSS measurements were: $\sigma_N, \sigma_E, \sigma_Z, PDOP$, satellites used. These parameters were processed, using the relevant rules in Fuzzy

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logic.

The reliability of the performed geodetic measurements was assessed done by two independent ways: human and Fuzzy logic.

The final results, calculated by Vienna_fuzzy – i.e. the rating of each measured point were analysed. Conclusions and proposals for future geodetic activities were given in the paper.

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