

The improved performance of the follow-up resolution of integer ambiguity in GPS/GNSS positioning

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This study accurately calculates the statistical performance of the follow-up type of integer ambiguity resolution in GPS/GNSS positioning, which is for the case just after the cycle slip of carrier phase measurements occurs. This study assumes that the cycle slip occurs in the measurements for all visible GPS/GNSS satellites simultaneously.

Such type of ambiguity resolution exploits the information of the accurate (single-differentiated) ionospheric delay for each GPS/GNSS satellite, which has been estimated during the carrier phase positioning with integer ambiguities resolved. Accordingly, it essentially has much higher performance of ambiguity resolution than that in the ordinary resolution, i.e., the beginning type of ambiguity one, even under the condition of long baseline length. The calculation result demonstrates such higher performance under the condition of 30-km baseline length.

The performance in integer ambiguity resolution is evaluated as the optimal success rate in statistical fixed-sample decision and calculated by Monte Carlo integration in this study.