

Geometry of Reference Stations in Network RTK

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SUMMARY

Using the GNSS (Global Navigation Satellite Systems) surveying methods give the users an advantage over the other traditional methods, where for instance, measurements between points with longer distances can be performed with no line of sight. Furthermore, the GNSS technology, through its real-time applications, can provide a basis for more efficient data collection and product automation, e.g., machine guidance. Nowadays, users do not need to have deep theoretical knowledge of GNSS to survey. They only expect a reliable and precise estimation of coordinates from the surveying instruments and GNSS services. It is the system providers, who face challenges to ensure a reliable delivery with consistent quality to the users and are, therefore, in need of planning tools and models to operate more efficient services. The developed simulation model in this paper provides an overview of uncertainties for the network RTK measurements and investigates the effect of network geometry on users' precision. Besides, the model is used to study the possible deterioration in users' precision if any reference station in the network stops working. This information provides a theoretical basis for densification strategies and evaluates if any reference station is more important than the others to maintain consistent quality in the network.

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