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Improvements of the precision and the reliability of underground geodetic networks by using stretched wires

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In underground geodetic networks, the orientation along the tunnel is generally limited in precision and reliability by, on one hand, the “corridor” configuration of the network and, on the other hand, by lateral refraction effects. As a stretched wire, if it is protected from air drafts, belongs to a section of a catenary function inside a vertical plan, it can be used as a precise and reliable orientation reference for total stations. Hence it will be shown how angular observations of a same stretched wire by different total stations can significantly improve the precision and the reliability of the orientations.

Summary

Keywords: Geodesy, underground surveying, total station, stretched wires, catenary, least-squares adjustment

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