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Application of common points selection method based on uniformity dividing space in HALF

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The alignment installation work of Hefei Advanced Light Facility (HALF) is usually carried out in tunnels. We convert the coordinates of the landmark points to the global coordinate system through coordinate transformation, and accurately adjust them to the corresponding coordinate values for alignment and installation. However, tunnels are often long and narrow, which can easily lead to ill-conditioned normal equations and loss of accuracy when solving coordinate transformation parameters. Therefore, to quickly and accurately obtain the coordinate transformation parameters, this paper proposes a common point selection method based on uniformity division space, which divides the coordinate transformation space according to the uniformity in different directions to select the optimal common points combination, and uses simulation and measured data to verify the method in this article. The results show that the conversion parameters solved by this method are more accurate and more stable, avoiding accuracy loss due to aggregation in a certain direction, and are suitable for narrow and long layout scenarios.

Footnotes

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Primary author: DING, Ting (University of Science and Technology of China)

Presenter: DING, Ting (University of Science and Technology of China)

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