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# A high-precision Measurement Design to Obtain Super Instrument Height

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Abstract: Since the accuracy of centering leveling and instrument height measurement is poor when the permanent point of device area in tunnel of the Chinese spallation neutron source (CSNS) being observing in the conventional GPS tripod observation mode, a high precision measurement scheme is proposed. In the scheme, the fine-tuned roof bracket and the hemisphere plumbing mirror are designed to ensure stable placement and precise alignment; GPS antenna head bracket is modified to be suitable for placing the target ball and use laser tracker to obtain high-precision large instrument height. Finally, six permanent points are measured twice individually using laser tracker which result is compared with the measurement result using the ruler and the results show that the scheme can achieve a high accuracy of 0.2mm in centering and 0.2mm in height measuring , Which avoids the influence of stretching using ruler to measure, and effectively improve the precision of centering and large instrument height measurement of the permanent point of device area of the CSNS. In addition, the new scheme also provides reference for centering and instrument height measurement of similar points.

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