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Technology and Application of Laser Tracker in Large Space Measurement

Position and posture measurements of large facility are necessary works in many fields, but the old one-dimensional measuring technology is no longer to meet the growing requirement of measuring accuracy, range and speed, so new measuring technology and method should be study. Point accuracy of micrometer can be realized by single station of Laser Tracker in small range, but it is necessary to establish precise three-dimensional control network to achieve the same high accuracy of coordinate measuring in large-space field. In order to get the points coordinate in centralized coordination, position and posture parameters of each station, a three-dimensional control network adjustment model based on observed value and coordination transformation is established. In order to decrease the influence on control network adjustment from angel measuring error, weight matrix of angel and distance based on high accuracy observed value of distance is established. This method is applied to facility installing and axis parallelism detecting in production line of Baosteel and result is good that the establish of large-space precise three-dimensional control network is realized successful based on theory of free multi-station measuring by laser tracker.

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