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An Application of Autocollimator for Surface Profile Measurement

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The autocollimator is a non-contact angle measuring instrument using the geometric light reflection principle. The instrument can be used in scientific research and industrial applications with high resolution. In this work, we propose an application of the autocollimator for surface profile measurement. We use an autocollimator to directly measure the tangent profile of a surface. The results can be interpreted as the first partial derivative of the surface along 2 reference axes. The higher derivatives can then be calculated. For second-order bi-quadratic approximation, the second derivatives are used to estimate the bending and twisting of a local surface. We compare our results with that of the industrial, high-resolution interferogram. The results agree well with the RMSE ranging from 2 nm to 10 nm.

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