

Calibration of a Large Standard Step Height with Low Sampled Coherence Scanning Interferometry

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Abstract : Scanning interferometry is commonly used for measuring the three-dimensional profiling of surfaces. Here, we used a scanning stage calibrated with standard gauge blocks to measure a standard step height of 200 μm . The stage measures precisely the envelope of interference at the platen and at the surface of the step height. From the difference between the two envelopes, we measured the step height of the sample. Experimental measurements show that the measured value matches well with the nominal value of the step height. A light beam of 532nm from a Tungsten Lamp is collimated and incident on the interferometer. By scanning, two envelopes were produced. The envelope at the platen surface and the envelope at the object surface were determined precisely by a written program code, and then the difference between them was measured from the calibrated scanning stage. The difference was estimated to be in the range of $198 \pm 2 \mu\text{m}$.

Keywords : optical metrology, digital holography, interferometry, phase unwrapping

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