

The fabrication and characterization of asymmetric gratings using the optical Talbot effect

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We fabricate asymmetric gratings, which have the ratio between the opening window and period or the opening fraction, $f < 0.5$. The gratings were fabricated by using CNC milling machine to engrave a pattern on transparent acrylic sheets. The characterization of the gratings is performed with the optical Talbot effect. The results of the Talbot pattern, as well as the intensity along the longitudinal distance, can apparently identify the opening window and grating period. The grating with the opening window of $23 \mu\text{m}$, period of $100 \mu\text{m}$, and thus the opening fraction of 0.23 can be obtained with our method. This type of grating can be used in many practical applications such as optical spectroscopy.

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