

Inclination shift signal: thickness or index measurement in transparent media by transmission of generally astigmatic Gaussian beams

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Resumen: The focus error signal is a widespread optical technique that harnesses the shape of a simply astigmatic Gaussian beam to produce an output signal with a well-defined linear range used for many different applications. However, general astigmatic Gaussian beams have not been extensively used for measuring purposes even though they have been known for decades. These beams have interesting properties which were used in this work as a mean to measure a change in the optical path and recover sample information. In this text, the formulae presented by E. Kochkina to represent generally astigmatic Gaussian beams are summarized, the principles of the proposed technique are set forth and two experimental results are presented as a validation of the proposal. A brief introduction to a different approach that enables the setup to perform simultaneous measurements of the thickness and refractive index is also given.

Palabras Claves: General astigmatism, Thickness measurement, Index measurement, Low-cost