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Accuracy improvement of bulk optical polarization interferometric sensors

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Keywords

optical sensing, interferometry, polarization, displacement measurement, homodyne interferometers, nonlinearity reduction, polarization mixing, beamsplitters

Abstract

Interferometric sensors using bulk optical components exhibit very high measurement resolution. In order to attain high accuracy, these sensors are often implemented as polarization interferometers, in which stable and well-defined states of polarization are maintained. Unwanted phenomena degrading accuracy of this class of sensors are discussed in the paper. Signal processing technique which improves accuracy of polarization interferometric sensors is presented. Its implementation using analogue circuits is discussed and a method of improving its performance is devised.