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Identification and estimation of nonlinearity in nano metrology system resulting from target velocity

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In the present study, we investigate the structure of Developed Three-Longitudinal Mode Heterodyne Interferometer (DTLMI). Then, the output relations of each part are obtained considering Polarizing Beam Splitter (PBS) leakage. According to this computational study, the identity of error in phase measurement is examined through simulations. According to these investigations, the error is as frequent changes around the real value and its amplitude is proportional to the leakage of Polarizing Beam Splitter (BPS). The results reveal that 2% leakage causes 3.18 nm and 2.05 nm errors at high and low target speeds, respectively. Target speed is also a determinant factor in the generated error type, so that in the speeds higher than a particular limit, 45 degree shift is seen in the periodic error and the amount of error will be larger.

Biography

Saeed Olyaee received his BSc degree in Electrical Engineering from University of Mazandaran, Babol, Iran, in 1997 and MSc and the PhD degrees in Electrical Engineering specializing in Optoelectronics from Iran University of Science and Technology (IUST), Tehran, Iran, in 1999 and 2007, respectively. He has established the Nano-photonics and Optoelectronics Research Laboratory, NORLab, in 2006 and currently, he is the Head of NORLab and Dean of Electrical and Computer Engineering Faculty, Shahid Rajaee Teacher Training University SRTTU), Tehran, Iran. He presented and published more than 100 scientific conference and journal papers, book, and book chapters, and currently, he is Technical Manager of Journal of Electrical and Computer Engineering Innovations (JECEI) and member of scientific committee of several national and international conferences. His main research interests include "Nano-displacement measurement, optical instrumentation and photonic crystal fibers".

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