

Analysis and formation of the transverse-mode composition of coherent radiation in a fiber optic waveguide with a stepped refractive index profile using DOE

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Abstract

The tasks related to measuring the power distribution over transverse modes of coherent radiation in optical fibers and excitation of particular transverse modes or their groups in a fiber are of practical importance for the research and development of fiber lasers, sensors, and fiber-optic communication lines. This work analyzes the possibility of selection of LP modes at the output of an optical fiber using binary amplitude MODANs. A technique for measuring the transverse-mode composition of radiation in an optical fiber with a stepped refractive index profile is developed and the measurements are carried out under various excitation conditions. A lowest-order mode, different from the fundamental one, is excited selectively in an optical fiber using a phase MODAN.

Keywords: transverse-mode composition, fiber optic waveguide, DOE, MODAN, fiber laser, sensor, communication line.

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