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Original article

Investigation of the semiconductor laser beam propagation through air and pure water (stable and turbulence)

Zahra, J.M.A. Al-Timimi
Laser Physics-College of Science for Women, Babylon University, Iraq

Abstract

Transforming the laser beam toward a mass flow has been a stimulus for both scientifically and technologically. As a foundation of estimating output laser performance, advancing exceptional beam quality is important for beam analyzing. We seek in this study to explain the beam characteristics of the laser in different conditions. By using an optical system consisting of a semiconductor laser with (λ= 650 nm, P= 4.64 mW). The attenuation and turbulence of the beam with different environmental conditions in the air and in the pure water (stable, turbulence) at different distances were studied and laser beam parameters (spot, shape and intensity) were included. The measurements were obtained by using a CCD camera and silicon detector type (Silicon PIN) in fast response (0.4-0.7A/W). The amount of the absorption coefficient of different conditions of the water was determined.

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