Abstracts

Computer-Aided Synthesis of the Optimum Refractive-Index Profile for a Multimode Fiber

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In a multimode optical fiber, the so-called multimode dispersion (mode-delay difference) is the principal cause that widens the transmitted pulse. The multimode dispersion can be controlled by the refractive-index profile. However, the optimum profile that minimizes the multimode dispersion has not yet been determined. This paper describes the computer-aided trial-and-error synthesis of the optimum refractive-index profile. It is shown that the group delay is reduced to about 10/sup -3/ times the value obtained with the uniform core fiber, to about 10 ps/km. This value is comparable to the material dispersion obtained with an ordinary fused-silica fiber and a typical semiconductor laser. It is also shown that the optimum profile is a smoothed W-shaped one.

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