Abstracts

Three-dimensional optical pulse simulation using the FDTD method

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As the use of optical waveguides expands, it would be desirable to have an explicit three-dimensional simulation method to analyze characteristics and develop new devices. One such method is the finite-difference time-domain (FDTD) method. The FDTD method requires a relatively high sampling density per wavelength, making simulation over distances of several wavelengths difficult. Several techniques are described to make such a simulation possible with limited computer resources. Among them is a moving problem space, which holds the pulse in the middle and moves the background medium past the pulse. Simultaneously, Fourier and wavelet analyses are used to characterize the pulse.

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