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The Beam Propagation Methode (BPM)

A versatile CAD-Tool for Simulating Optical Components

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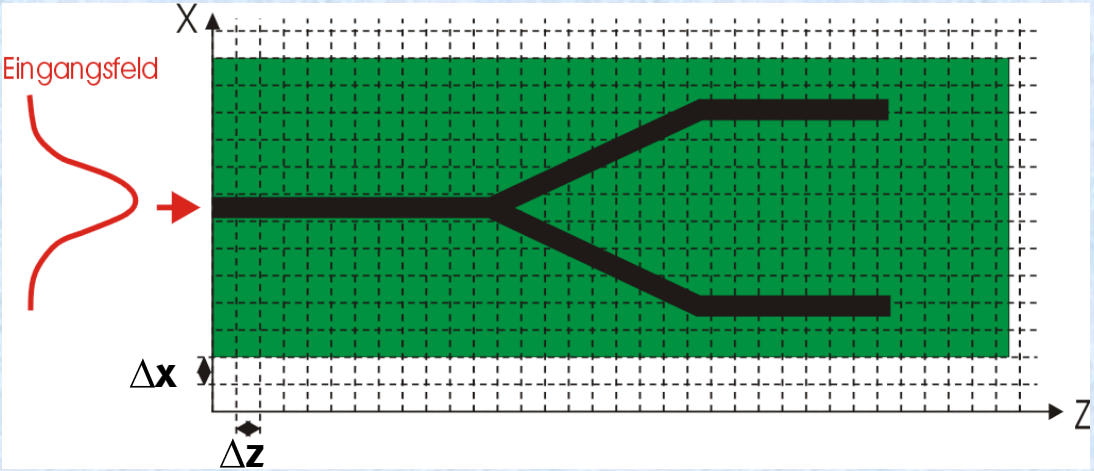
A typical structur to be simulated



- The positions z and z+Δz are related by an operator
- Thus, the field distribution at any position i*Δz can be calculated

Calculation Basics

1. $f(x, z=0) = FFT(\text{input electric field})$

2. $f(x, z+\Delta z) = e^{i \cdot P(x) \cdot \Delta z} \cdot f(x, z) \quad ; P(x) = \dfrac{x}{\dfrac{n}{\lambda} + \sqrt{\dfrac{n^2}{\lambda^2} - x^2}}$

with n : refractive index

λ : wavelength

-> equals free space propagation

3. $f(x, z+\Delta z) = e^{-i \cdot 2\Pi \frac{\Delta n}{\lambda} \cdot \Delta z} \cdot f(x, z+\Delta z)$

with Δn : refractive index difference between waveguide and substrate

-> equals refocusing the field dueto waveguide

BPM Software