

# Chapter 2

## *Waveguide theory*

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### 2.1) Introduction

### 2.2) The wave vector and propagation constant

### 2.3) Waveguide modes

### 2.4) Mode solutions

### 2.5) The beam propagation method (BPM)

### 2.6) Dispersion

2.6.1) *Material dispersion*

2.6.2) *Waveguide dispersion*

2.6.3) *Total dispersion estimate*

2.6.4) *Polarization mode dispersion (PMD)*



### 2.7) Loss and signal attenuation

2.7.1) *Fundamental absorption loss*

2.7.2) *Fundamental scattering loss*

2.7.3) *Waveguide bending loss*

### 2.8) Conclusion

### 2.9) References

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