Polarization Dependence in Nonlinear Fiber Optics

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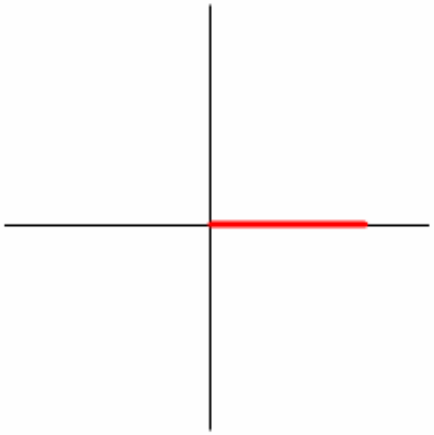
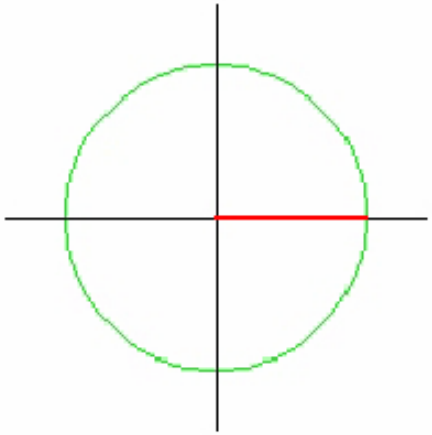
PRL

Polarization

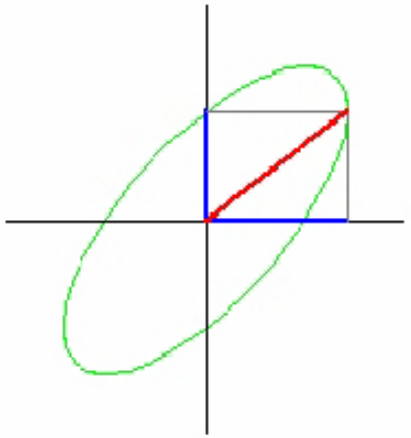
Linear



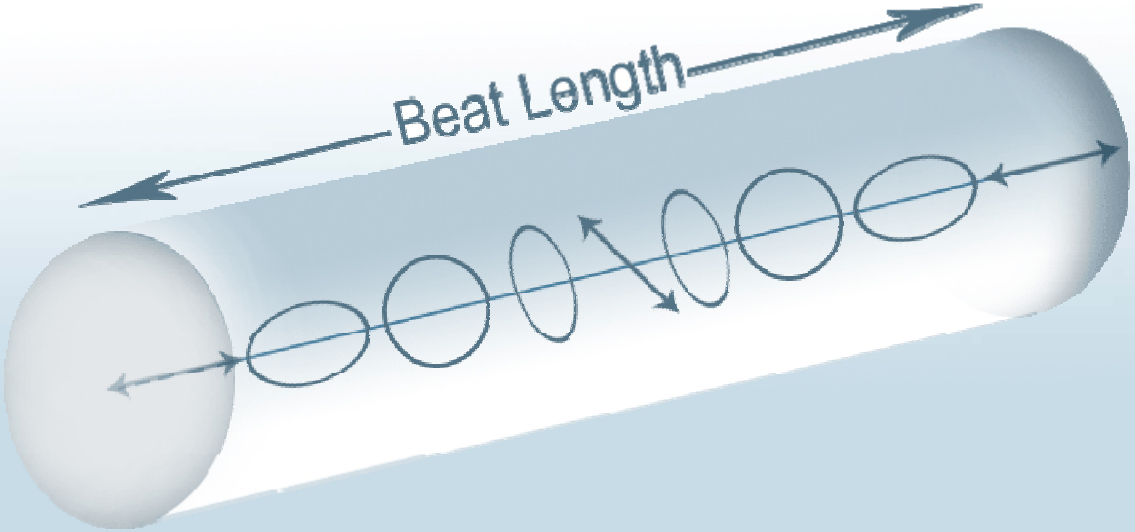
Circular



Elliptical



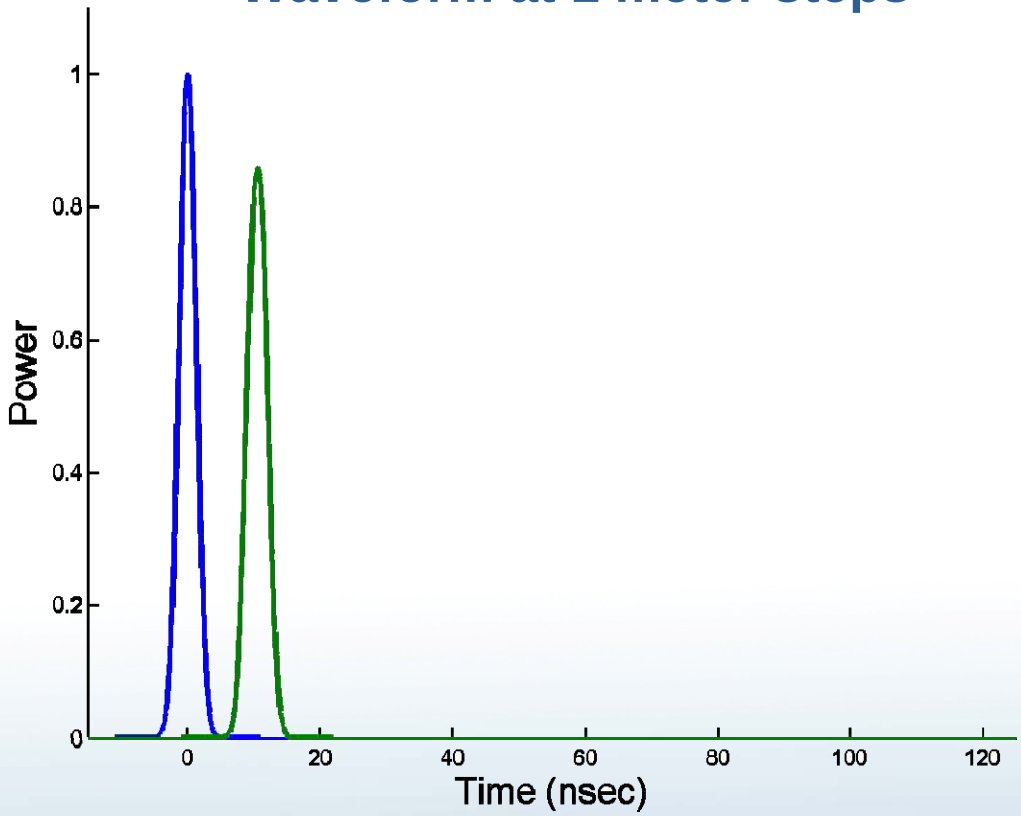
Polarization changes as it travels down the optical fiber



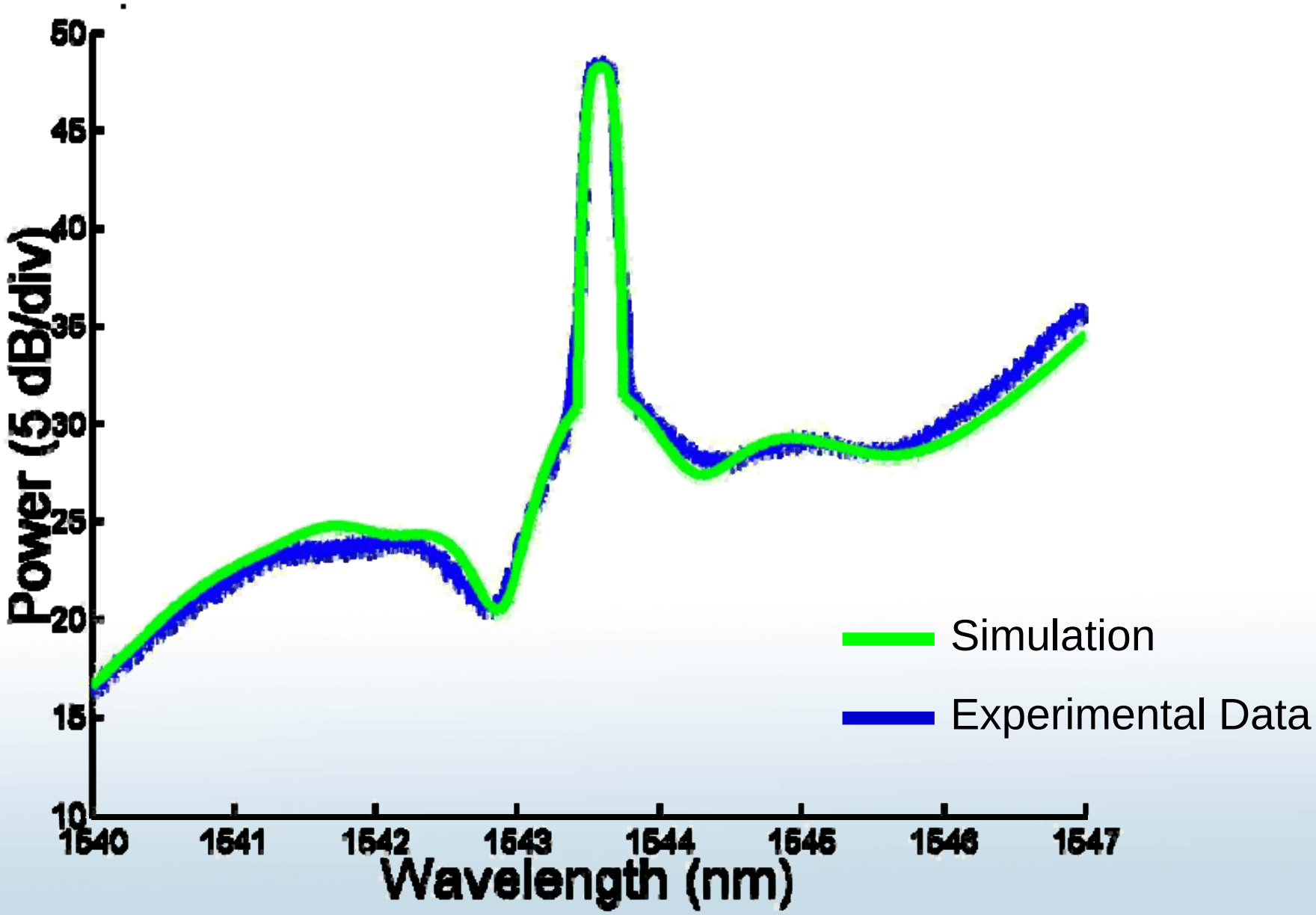
Simulated Effects

- Polarization dependent loss
- Polarization mode dispersion
- Dispersion
- Nonlinearities:
  - self- and cross-phase modulation

Waveform at 1 meter steps



Experimental Data vs Simulation



Conclusion

- Polarization must be accounted for
- Our model closely matches experimental data
- The model can be used by engineers and teachers around the world