Nanostructures for Photonic Bandgap Devices using Garnet Films

Samir Mondal and Beth Stadler Electrical and Computer Engineering, University of Minnesota

- Motivation: Nanostructures in garnet allow photonic bandgaps
- Simulations allow design of devices
- RIE allows fabrication using self-assembled masks



Band structure of the TE-like (light circles) and TM-like (dark circles) modes of the 2D patterned photonic crystal slab (inset: air holes in garnet film).

- Results: Polarizers have been successfully designed.

- Both TE-blocking and TM-blocking polarizers have been designed and incorporated with Faraday rotator
- Nanostructured masks are made and etching is ongoing



Transmission loss vs. length of photonic crystal polarizer incorporated with Faraday rotator.



Samir K.Mondal and Bethanie J. H. Stadler, "Novel designs for integrating YIG/air Photonic Crystal slab polarizers with waveguide Faraday rotators." Accepted for publication in *Photonics Technology Letters* (2004).

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