Fabrication of High-Aspect Ratio Yttrium Iron Garnet (YIG) Waveguides and Photonic Crystal Polarizers

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I Motivation: Integrated Optical Isolators

1) High-aspect ratio (Height :Width) ridge waveguide reduces birefringence

- Reactive Ion Etching (RIE): expensive and time-consuming;
- Standard wet etching: rough, poor optical quality;
- An innovative wet etch has been developed that gives smooth, high-aspect-ratio waveguides.



Ridge waveguide after annealing (Aspect Ratio ~ 1)

2) Focused Ion Beam Etching to produce photonic crystal polarizers.





Sang-Yeob Sung, Xiaoyuan Qi, and Bethanie J. H. Stadler, Applied Physics Letters 87, 121111 (2005) Samir K.Mondal and Bethanie J. H. Stadler, *IEEE Photonics Technology Letters* 17 [1] 127-129 (2005) *MINNESOTA*