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Ultra wideband, high sensitivity magneto-optic field sensor[1]
DONG HO WU, ANTHONY GARZARELLA, Naval Research Laboratory, VINCE FRATELLO, Integrated Photonics Inc. — Using the bismuth rare-earth iron garnet thick films we have demonstrated a magneto-optic (MO) field sensor. The sensor made of all dielectric materials is nearly noninvasive, and is operated at room temperature. The sensor's sensitivity is scalable; the same sensor design can be used for a low-field sensor to measure fields below nano-Tesla or for a high-field sensor to measure several hundred Tesla. The highest sensitivity that we have achieved with the sensor is about 30 pico-Tesla/$(\text{Hz})^{1/2}$. Presently its frequency range is limited from DC to 2 GHz. We have carried out several different experiments with this sensor to explore a few interesting applications, such as electromagnetic signal interception tests over a very broad frequency range. In this presentation we will report our experimental results obtained from this MO field sensor.

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