

Photon Management III
Proc. SPIE., Volume 6994, Pages 69940Y
SPIE--The International Society for Optical Engineering

Polarization Simultaneous Readout for Volume Holographic Storage in LiNbO₃

Su, Wei-Chia; Chen, Chien-Yue; Liu, Yau-Wen; Lin, Ching-Huang; Yuh Ouyang

Abstract

We have successfully demonstrated a holographic memory in a single LiNbO₃ crystal with two simultaneous but individual readout channels. A special scheduled exposure model is derived to obtain equal diffraction efficiency of each hologram in this memory. The simultaneous readout technique is achieved in a hybrid-multiplexed memory using angular multiplexing and the polarization multiplexing. Polarization multiplexing offers the mechanism of simultaneous readout for two individual orthogonally polarized images. In each angular position of the holographic memory, these two orthogonally polarized images can be reconstructed simultaneously and each of them can be viewed independently. After our proposed scheduled exposure, experimental result of diffraction efficiency in each hologram becomes equal and the result is consistent with our prediction.