

## 다중-노출 홀로그래피 방법을 이용한 광자 준결정 제작 및 밴드갭 특성

윤상돈, 여종빈, 이현용  
전남대학교

### **Fabrication of photonic quasicrystals using multiple-exposure holographic method and bandgap properties**

Sand-Don Yun, Jong-Bin Yeo, Hyun-Yong Lee  
Chonnam National University

**Abstract** : Two-dimensional photonic quasicrystal (PQCs) template patterns have been fabricated on a  $1.1\mu\text{m}$ -thick DMI-150 photoresist using a multiple-exposure holographic method. A 442-nm HeCd laser was utilized as a light source and the holographic exposure was carried out at a fixed angle of  $\theta=6^\circ$ . After the first holographic exposure, the sample was rotated to a proper angle and the second exposure was performed to the same manner. This exposure process was repeated  $n/2$  times to obtain  $n$ -fold symmetric PQC patterns and then the sample was developed. The fabricated PQCs exhibited 8, 10 and 12-fold rotational symmetry and the diffraction patterns using a 632.8-nm HeNe laser were observed for  $n$ -rotation symmetry corresponding  $n$ -fold PQCs. The fabricated PQC template patterns were examined using scanning electron microscopy(SEM). Transmission spectra were measured fourier transform infrared(FTIR) spectrometer.

**Key Words** : photonic quasicrystal, holographic method, rotational symmetry, diffraction patterns