

Temperature influence on electrically controlled liquid crystal filled photonic bandgap fiber devices

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The thermal and electrical tunability of liquid crystal filled photonic bandgap (LCPBG) fibers has been studied [1, 2]. Here, we investigate the temperature influence on electrically controlled LCPBG fiber device as shown in Fig. 1. Fig. 2 shows the driving voltage of Large Mode Area photonic crystal fiber (LMA13, Crystal Fibre A/S, Denmark) filled with MLC-6608 (Merck, Germany) as a function of wavelength for realizing quarter and half wave plates at different temperatures. Fig. 3 plots phase shift in wavelength range 1520nm-1600nm for realizing quarter and half wave plates at different temperatures by applying a certain voltage. Fig. 4 illuminates the relative phase difference on Poincaré sphere for different electrode configurations (ECs) of four electrodes corresponding to three directions of the electric field (0° , 45° , 90°) as a function of voltage at 25°C .

References

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- (2) L. Wei, L. Eskildsen, J. Weirich, L. Scolari, T. T. Alkeskjold, A. Bjarklev, Appl. Opt. **2009**, 48. 497-503

