# Temperature effects of Mach-Zehnder interferometer using a liquid crystal-filled fiber - DTU Orbit (08/11/2017)

## Temperature effects of Mach-Zehnder interferometer using a liquid crystal-filled fiber

We demonstrated a simple and cost-effective method to fabricate all fiber Mach-Zehnder interferometer (MZI) based on cascading a short section of liquid crystal (LC)-filled hollow-optic fiber (HOF) between two single mode fibers by using automatically splicing technique. The transmission spectra of the proposed MZI with different LC-infiltrated length were measured and the temperature-induced wavelength shifts of the interference fringes were recorded. Both blue shift and red shift were observed, depending the temperature range. Based on our experimental results, interference fringe was observed with a maximum interferometric contrast over 35dB. The temperature-induced resonant wavelength blue-shifts 70.4 nm for the MZI with an LC length of 9.79 mm and the wavelength temperature sensitivity of -1.55 nm/degrees C is easily achieved as the temperature increases from 25 degrees C to 77 degrees C. (C)2015 Optical Society of America

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