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Thesis: **"DESIGN, FABRICATION AND INVESTIGATION OF SPECIAL PHOTONIC CRYSTAL FIBERS FOR MULTIPARAMETER SENSING"**

Summary:

In this work, a special two-ring single-mode photonic crystal optical fiber with high losses of the fundamental mode is designed for multiparameter sensing applications using the lossy mode resonance phenomenon. To achieve this phenomenon, a photonic crystal fiber with an absorptive coating was analyzed, and causal relationships between design parameters and system response were found. Subsequently, a pair of optical fibers were manufactured by varying the microstructure, and a setup was implemented using bending to promote confinement losses. Tests were then conducted to corroborate the existence of resonant modes through the influence of the coating.