Title: Supercontinuum Generation in Dispersion Engineered Silicon Carbide Photonic Crystal Fiber.

Author Name: Rakayet Rafi, Runi Nath, Md. Sabuz, Zahida Zakir, M R Karim, B Rahman

Abstract: This study presents the design of a hexagonal pattern photonic crystal fiber (PCF) using silicon carbide as the guiding material. This is achieved by modifying the PCF's geometrical characteristics, such as lattice pitch and air hole diameter. We observed that flatter dispersion curves and less confinement loss may be achieved by raising the pitch from 1.5µm to 1.9µm. We have further investigated the Supercontinuum Generation phenomenon using Generalized Non-linear Schrodinger Equation (GNLSE), of a 10mm length of PCF design having parameters as pitch 1.9µm, air filled fraction 0.9. It resulted in spectra spanning from 800 nm to 2800 nm at above −40 dB spectral power range which is in the Mid Infrared region. This is, to the authors knowledge, first exploration of SupercontinuumGeneration in a SiC based photonic crystal fiber (PCF).

Keyword: Hexagonal PCF, Confinement Loss, Dispersion, Supercontinuum Spectra.

DOI: [10.1109/ICEEICT62016.2024.10534492](https://doi.org/10.1109/ICEEICT62016.2024.10534492)