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(57) Abstract :

In this work, optical power loss occurring in SOI waveguides has been addressed by the use of graphene as an additional cover layer over the SOI structure. Design and comparative analysis of a pure SOI optical waveguide and a graphene-based SOI optical waveguide has been presented for optical sensing applications. Eigen-mode solver has been employed to numerically simulate the SOI waveguide sensor, designed to incorporate a sensitive gap between the input and Output waveguides. Single mode Operation is achieved at a Silicon Channel height of 200 nm, with a 1nm thick graphene cover layer. The use of graphene as a cover layer over the SOI waveguide results in a significant reduction in the optical loss. A reduction in the optical loss of 254.64 dB/um has been achieved for a transmitting length of 5.5 um at a wavelength of 540 nm.

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