

## Numerical Simulation of Fiber Bragg Grating Spectrum for Mode-I Delamination Detection

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**Abstract :** Fiber Bragg optic sensor embedded in composite material to detect and monitor the damage which is occur in composite structure. In this paper we deal with the mode-I delamination to determine the resistance of material to crack propagation, and use the coupling mode theory and T-matrix method to simulating the FBGs spectrum for both uniform and non-uniform strain distribution. The double cantilever beam test which is modeling in FEM to determine the Longitudinal strain, there are two models which are used, the first is the global half model, and the second the sub-model to represent the FBGs with refine mesh. This method can simulate the damage in the composite structure and converting the strain to wavelength shifting of the FBG spectrum.

**Keywords :** fiber bragg grating, delamination detection, DCB, FBG spectrum, structure health monitoring

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