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## **Evaluation of Recovery of Flexural and Compressive Properties of Self-Healing Composites using Acousto-Ultrasonic Technique**

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This study examines the recovery of mechanical properties (flexural and compressive) of the novel intrinsically healing fibre-reinforced polymer composites. These self-healing composites are prepared from a blend of thermoset resins with self-healing properties and high-strength carbon fibres. The composites are subjected to different levels of unstable damage to their polymer matrix. Then they are healed by using heat as an external stimulus. The healability of these self-healing composites are evaluated by testing them in different states: virgin state, damaged state, and healed state. In this context, the evaluation is also carried out using the Acousto-Ultrasonic test, a non-destructive evaluation technique. For this test, artificial Lamb waves are propagated through the composites in different states and the frequency and time-frequency characteristics of the propagated Lamb waves are analysed. Statistical distance metrics such as Bhattacharyya coefficient and Kullback-Leiber divergence and other time-frequency dependent parameters are used to analyse the propagated Lamb waves. In summary, the recovery of the mechanical properties and the structural properties of the self-healing composites are analysed by standard mechanical and Acousto-Ultrasonic test.

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