

A Composite Material Leaf Spring with Fiber Bragg Grating as a Sensor System for Dynamic Vehicle Loading

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A fiber Bragg grating sensor attached to the composite material leaf spring as a sensor system is proposed for dynamic vehicle loading. The load borne by the leaf spring was calculated from the period change of the fiber grating caused by the deformation of the composite material leaf spring under loading. From the results of a light intensity calibration experiment, a linear relationship between load and voltage signal was found when the composite material leaf spring was deformed under loading. The R-squared value of the linear relationship reached up to 0.984. Data from a temperature compensation experiment supported the reliability of the temperature compensation framework of the study.

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