

Application of Nanomaterials in Monitoring Fatigue in Highway Bridges

Amer Alkloub

University of Jordan, Jordan

As the manufacturers of trucks boost the capacity of trucks to carry heavier loads, old bridges are encountering loads that might be exceeding their capacity. With aging of highway bridges the need for effective methods of structural health monitoring has become increasingly important. Generally, different types of sensors are used to evaluate structural health, including optical fibers, strain gauges and sensors. However, these sensors have some crucial boundaries and disadvantages, such as high cost, poor resilience, low sensitivity and insufficient compatibility with concrete and expensive supporting equipments such as data acquisition system. Electrical properties of carbon-based materials in structural engineering are drawing attention of scientists for many years, giving hope for smart materials and self-monitoring structures. The current study used data that were collected previously by other researchers. The collected data were used to study the adequacy of the bridge girders in the context of the fatigue performance. Number of cycles and amplitude of fatigue stresses were investigated at different locations along the bridge girders.