

Development of a smart instrumentation for analyzing railway track health monitoring using forced vibration

ABSTRACT

Harmonic responses play a prominent role in determining metallic faults in railways. Therefore, it is useful to develop some instrumentation governed by the principles of forced vibration to evaluate the health condition of a railway track. The conventional systems developed to identify track damage have large deviations in measurements and are not reliable for examining track faults such as track drainage faults and surface damaged faults. This study focuses on the development of an instrument that analyzes track damage wirelessly in real time. Based on forced vibration, the relation between the harmonic response with the amplitude is demonstrated. The developed instrument was validated on an actual railway track. The result shows that, the developed instrument can be used to determine the serviceability of the railway track, thus avoiding any potential catastrophic events.