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# Vehicle Tracking Using Mobile Wireless Sensor Networks During Dynamic Load Testing of Highway Bridges

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The development of structural health monitoring systems for bridge structures necessitates improvements in the understanding of vehicle-bridge interactions. Direct measurement of the complex coupling that naturally exists between vehicles and bridges is a challenging undertaking due to the limitations of existing sensor technologies. However, the emergence of wireless sensors in the field of structural health monitoring has created opportunities for directly monitoring vehicle-bridge interactions. In this study, the mobility of wireless sensors is exploited to instrument a test vehicle with inertial and vibration sensors. The mobile wireless sensor network installed within the test vehicle is time-synchronized with a wireless sensor network permanently installed on a highway bridge. The time-synchronized vehicle and bridge vibration measurements represent a rich set of input-output data from which vehicle-bridge interactions can be thoroughly studied. In addition, Kalman estimation can be used to accurately track the location of the test vehicle during forced vibration testing of the bridge. Experimental testing of the mobile wireless sensor network on the Yeondae Bridge is presented in detail.

**Ключевые слова:**

**Содержание.**

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