

# **Damage Assessment of Long-span Bridges using GPS/Accelerometer Observations under Dynamic Effects**

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**Key words:** Bridge surveying; Deformation measurement; Engineering survey; Positioning

## **SUMMARY**

This study investigates at evaluating long span bridges using the integrated real-time kinematic global positioning system (RTK-GPS) and accelerometer technique. The data were collected from structural health monitoring system that installed on Yonghe cable-stayed bridge, China. A high-rate (20 Hz) GPS and 100 Hz accelerometer were utilized and integrated to observe the bridge behavior. A healthy and damage cases are evaluated under complicated loads, including traffic and ambient environmental loads effects. The time and frequency domains and numerical model were applied to assess the integrated system. The analysis of the results of the integrated system showed high correlation between the GPS/accelerometer observations in both time and frequency domains, particularly after occurrence of the damage. In addition, the GPS/accelerometer system observations demonstrate the significant efficiency of GPS observations for the damage in the time domain, while the accelerometer observations seem more effective in investigating effect of the damage in the frequency domain.

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