

Dynamic Modal Identification Of A Long-Span Bridge Under Extreme Wind Load

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Wind vibration characteristics of the Bosphorus Bridge is investigated using SHM data. The bridge experienced a critical wind load in 2012. During the event, wind speed reached to approximately 100 km/h within a short duration of 10 min. It is therefore significant to determine the influence of this event on the response of the bridge. For this objective, The SHM data is considered for structural identification of the bridge. Mode shapes and corresponding frequencies of the bridge are obtained by FFT analyses. The comparison of the results during strong wind with those from after the extreme event showed that strong wind led to higher modal period values in the transverse and vertical modes. The bridge is estimated to have high damping capacity under extreme loading. In addition, the modal frequencies obtained after the strong wind proves no damage to the bridge due to the same modal values of the bridge under normal operation conditions.