

**Analysis of Ground Vibration  
Caused by High-Speed Train Running through Viaduct**

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In this report, we analyze the phenomenon where ground vibration in the low frequency band below 5 Hz increase when a high-speed train runs through a viaduct. As a result, we find that the cause of the phenomenon is that increasing train speed shifts the peak frequency of the excitation force due to a train running to the higher frequency side, which is close to the frequency response function of structures and ground. In addition, we reveal that the first bending mode of girders resonates with the excitation force of a train running. From this, we show the possibility that the first bending mode of girders can correspond to the peak of the frequency response function of structures and ground.