二維矩柱體橫風向與扭轉向振動耦合之氣動力現象

Wind load, a very important factor that contributes to the stabilityand durability of a structure, could cause an interesting effect onhigh-rise buildings. Such an effect takes place when the frequency ofacross-wind vibration exerted on the high-rise building coincides withthe frequency of torsional vibration, resulting in a complexaerodynamic phenomenon. This study was focused on the coupling ofacross-wind and torsional vibrations of two-demensional rectangularprisms. The experiments were carried out by placing the small-scaleaerodynamic model in a laboratory wind tunnel that is capable ofgenerating both across-wind vibration and torsional vibration. Fromthe results of wind tunnel tests, the relationship between theaerodynamic coefficients and a set of variables including vibratingfrequency, torsional frequency, and torsional angle, was established.