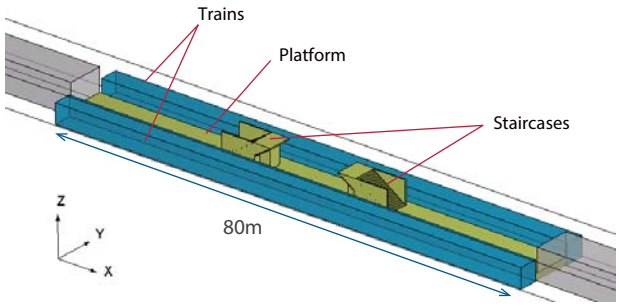
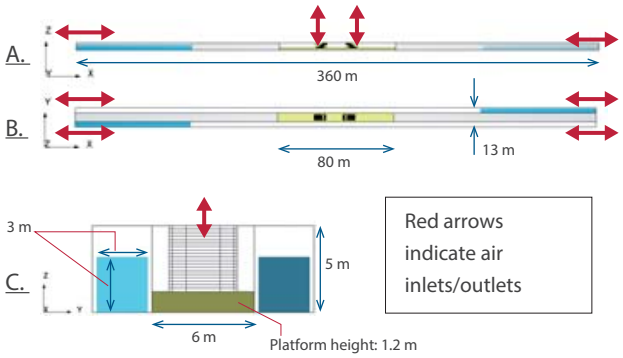
Wind Environment on a Metro Platform

scSTREAM is used to simulate wind environment of a metro platform. Two trains enter and stop at the station simultaneously. Wind velocity is calculated at two specific locations where commuters will be waiting for the trains.

Simulation Model

80m x 6m x 1.2m platform: A. Side view B. Top view C. Cross section

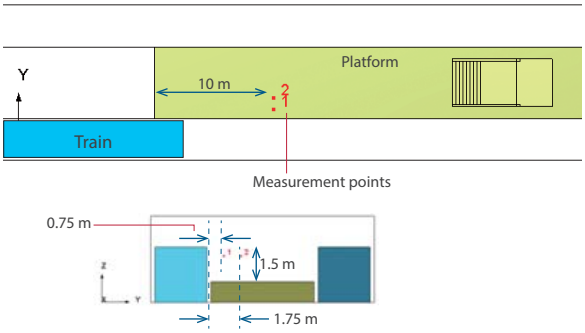




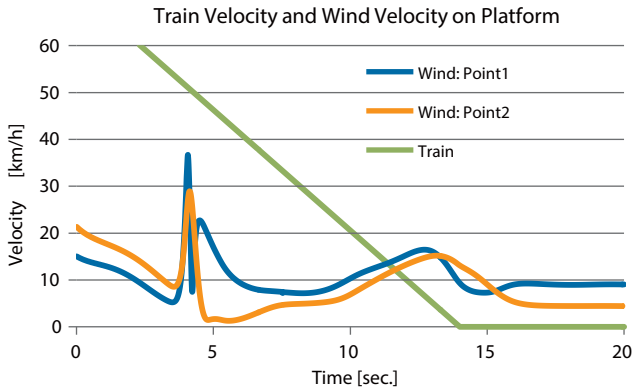
Conditions and Results

Wind velocity measurement locations

Wind velocity is measured at two points, 0.75m and 1.75m away from the edge, respectively, and 1.5m high.



Measured velocity



Discussions:

Wind velocities at the measurement points are high (10-20 km/hr) as the train approaches the platform. When the front of the train passes by the measurement points (t = 4 sec), it creates a strong gust of nearly 40 km/hr. The gust is stronger at point 1 (nearer the train) than at point 2. As the train passes by, the wind velocity is usually stronger at point 1.

Wind velocity contour plot at 5 sec. (height equal to measurement point)

Notes

scSTREAM confirms that a person standing on the platform waiting for the train can be exposed to very strong wind gusts as the trains decelerate to a stop. The gusts can approach 40 km/hr near the edge of the platform and near the staircases.