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Effects of building complexes on low-level wind shear around an airport: A wind tunnel test

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ABSTRACT

Low-level wind shear around an airport is a significant safety concern during the aircraft takeoff and landing process since it can abruptly change the aircraft's track and affect aircraft's stability and maneuverability. Its intensity can be significantly influenced by the surrounding terrain and buildings. In this paper, terrain factors are not considered. Instead, the effects of building complexes on low-level wind shear around an airport are investigated through a wind tunnel test. The building complex being investigated, which consists of five individual buildings, is located on the east side of the Hong Kong International Airport. This test investigates the effect of south wind on the wind field near the 25RA glide slope. Three inflow velocity conditions are considered, namely 5, 8 and 10 m/s. The result indicates that the complicated interaction between the building's wake and the ground can cause considerable wind fluctuations, which may lead to potential risks of low-level wind shear, even when the glide slope is fully away from the velocity deficit zone near the leeward side of the building complex.

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