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Thermally Driven Flow in a Mock Street Canyon ANN DALLMAN, University of Notre Dame, SIGURDUR MAGNUSSON, LESLIE NORFORD, MIT, HARINDRA J.S. FERNANDO, University of Notre Dame, DARA ENTEKHABI, REX BRITTER, MIT, SHANSHAN PAN, Nanyang Techinal University — Under conditions of low synoptic winds and high solar radiation, non-uniform heating of building walls and the ground in an urban street canyon induces thermally-driven airflow. These effects have mainly been studied using wind-tunnel experiments and numerical models, but only a few field-scale experiments have been performed. However, this is an important topic of interest because of its implications for air quality and emergency response planning. A field experiment was carried out in collaboration between the Singapore-MIT Alliance for Research and Technology (SMART) and the University of Notre Dame. The study was conducted on the campus of Nanyang Technical University in Singapore, and consisted of an 'idealized' building canyon constructed with two rows of shipping containers aligned in the North-South direction. The site was carefully instrumented with sonic anemometers (for wind speed and direction and virtual temperature), weather stations (wind speed and direction, temperature, relative humidity, pressure, and rain fall), and thermocouples (surface temperature of buildings). Measurements were recorded for 9 days, which included periods of sunshine and high convective activity that created thermal circulation between the buildings. Using a fog machine, flow visualization was carried out to observe circulation patterns. An overview of the experiment and the results will be presented.

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