

Abstract Submitted  
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**Design and Testing of an Absolute Pressure Sensor Mote to Measure Full-Scale Wind Pressure Loads on Buildings**<sup>1</sup> JOHN HOCHSCHILD, CATHERINE GORLE, Stanford Univ — Several studies comparing wind loads measured at the full- and model-scale on low-rise buildings have consistently found peak pressures to be underestimated at the wind tunnel scale. However, there is a lack of data comparing full- and model-scale wind loads over larger buildings. This is primarily due to experimental challenges: the distribution of differential sensors around a large building is too complicated, and non-intrusive absolute pressure sensors have traditionally lacked the resolution required to measure pressure coefficients. Our objective is to leverage a new generation of absolute pressure sensors, such as the Bosch Sensortec BMP388, to measure wind loads on large buildings. First, we determined that the sensor has low enough noise (1.7 Pa RMS) to make meaningful  $C_p$  measurements, and we demonstrated that it is capable of measuring fluctuations on the time scales associated with turbulence in a wind tunnel experiment. Subsequently, we have designed a low-cost, compact, wireless mote that features the BMP388. Extensive testing of several motes has shown it to be a robust data-acquisition system, attainable at a fraction of the cost of commercially-available dataloggers with similar capabilities, and we have begun deploying motes over a high-rise building.

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