

Abstract Submitted  
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**Insight on Turbulence Characteristics of an Urban-type Boundary Layer**<sup>1</sup> BRUNO MONNIER, JONATHAN SWANSON, CANDACE WARK, Illinois Institute of Technology — An experimental investigation of the flow through an urban-type boundary layer (4 rows of 3 cuboid Plexiglas blocks) in an experimentally modeled atmospheric boundary layer will be presented. Stereoscopic PIV is utilized to obtain 3D flow characteristics of the flow field within this complex geometry. The streamwise spacing of the array is chosen so as to mimic a common flow regime in urban areas, i.e. skimming flow regime. A large number of vertical planes distributed across the streets allows for a very good spatial description of the flow features. Measurements are obtained directly upstream of the model and in each of the middle streets of the 4 by 3 array. Coherent structure identification tools are used to highlight the 3D patterns within each of the streets. A large number of SPIV realizations in the domain provides valuable information about the flow field turbulence statistics as the flow is evolving from one street to the next. The incidence angle of the incoming flow field is also varied to assess the effect of flow channeling within the urban environment. Finally, two mean free stream speeds are studied to investigate the effect of the incoming wind profiles on the flow field turbulence.

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