

Abstract Submitted  
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**Turbulence generation behind orificed, perforated plate**  
ARINDAM SINGHA, RUI LIU, DAVID S.-K. TING — There were many investigations on grid generated turbulence, but almost all of them concentrate on the decaying region of turbulence, at a considerable distance from the grid. The investigation at the region just behind the grid, where the “grid shadow” is still visible, is limited. In this region, considerable inhomogeneity and anisotropy of turbulence flow field is expected. Past studies show that the identification of the point of onset of decaying turbulence is important in unification of the theory of turbulence. This present study aims to focus on the different aspects of identification of the starting position of the decaying turbulence region. In the present study, the turbulence characteristics in the region behind an orificed, perforated plate are explored. Orificed, perforated plate is used instead of conventional grid, as it is expected to produce more isotropic turbulence due to the absence of the effects of finite grid thickness. The experiments are carried out at freestream Reynolds number of 12700 in a closed circuit wind tunnel of  $0.75 \times 0.75 \text{ m}^2$  working cross section. The measurement plane is chosen as a square plane of  $0.25 \times 0.25 \text{ m}^2$  at the central portion of the test section at streamwise distances of  $10M$ ,  $15M$  and  $20M$  respectively from the perforated plate, where  $M$  is the mesh characteristic dimension. The turbulence flow field is interpreted with the help of the theory of isotropic turbulence.

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