# Chapter 6

# Conclusions

As part of the study of wind damage to low-rise structure caused by extreme wind loads, this research provides a comprehensive study of simulation parameters in Clemson wind tunnel for different configurations. The results provide a basis for further comparison with the full scale results. In this work, we discussed the establishment of different configurations in Clemson wind tunnel, and we decided to see how these different configurations influence the characteristics of the turbulence as reflected by turbulence parameters, such as mean flow Reynolds number, turbulence intensity, integral length scale, large and small scale turbulence, and spectra of velocity components. In addition, the intermittency parameters which could characterize the intermittency events in turbulence are obtained by applying a new method, wavelet transform, are discussed. Finally, pressure characteristics for the different configuration were studied. The above work leads to the following conclusion:

- The characteristics of turbulence, generated from wind tunnel, can be varied by utilizing configurations with different spires, tripping elements, baffles and roughness elements.

- It is concluded that, the effect of introducing small spires in the wind tunnel is to increase the level of turbulence, and shift energy from intermediate

scales to small scales for both u- and v- components. For intermittency characteristics, the small spires tend to decrease intermittent behavior in large scales and increase the intermittent behavior in small scales.

- #7 spires can shift energy from large scales to small scales, and are very effective to increase the level of turbulence levels in v- component.

- Between the baffle configuration and the conventional configuration, the baffle roughness tends to generate a flow with lower mean velocity longitudinal, higher turbulence intensity and higher integral length scale.

- The new intermittency parameters, obtained from orthonormal wavelet transform can be used to characterize the intermittent behavior of the turbulence.

- Peak pressure characteristics can also be varied by different configurations, and they could be connected to the intermittency behavior by studying intermittency parameters.

- It is concluded that, higher wavelet coefficients in smaller scales in both u- and v- may result in stronger negative pressure peaks. The high intermittency factor may have some relation to the non-stationery characteristics of the simulated flow.