



Low Speed Wind Tunnel Design and Optimization Using Computational Techniques

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Experimental aerodynamics in general is related to conducting experiments in the wind tunnel. The wind tunnel design topic is very old but the development in computational fluid dynamics led to improvement in the wind tunnel design. This paper describes design and optimization of low-speed wind tunnels with the help of CFD techniques. The new optimum wind tunnel will replace the old wind tunnel which has poor air quality in the test section and small test section area with lower wind speed. The pressure drops calculation comparison between the two tunnels using CFD is included in this research. The contraction cone was optimized using response surface technique. A computational domain was generated and adopted using ANSYS mesh generator and the solution domain was analyzed by simulation technique using FLUENT CFD code in ANSYS Workbench package. Results identified that the pressure drop, and turbulence level is modified compared to the old wind tunnel.