

Experimental Investigation of Boundary Layer Transition on Rotating Cones in Axial Flow in 0 and 35 Degrees Angle of Attack

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Abstract : In this paper, experimental results of using hot wire anemometer and smoke visualization are presented. The results obtained on the hot wire anemometer for critical Reynolds number and transitional Reynolds number are compared by previous results. Excellent agreement is found for the transitional Reynolds number. The results for the transitional Reynolds number are also compared by previous linear stability results. The results of the smoke visualization clearly show the cross flow vortices which arise in the transition process from a laminar to a turbulent flow. A non-zero angle of attack is also considered. We compare our results by linear stability theory which was done by Garret et. Al (2007). We just emphasis, Also the visualization and hot wire anemometer results have been compared graphically. The goal in this paper is to check reliability of using hot wire anemometer and smoke visualization in transition problems and check reliability of linear stability theory for this case and compare our results with some trusty experimental works.

Keywords : transitional reynolds number, wind tunnel, rotating cone, smoke visualization

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