

عنوان مقاله:

Control of Laminar Separation Bubble using Vortex Generators

محل انتشار:

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خلاصه مقاله:

In this paper, the performance of sub boundary layer vortex generators and conventional vortex generators in controlling the separation bubble has been compared and the resultant highly three-dimensional flow has been studied. Two pairs of vortex generators mounted symmetrically along the spanwise direction are placed upstream of separation point to produce counter-rotating vortices. Effect of these three-dimensional vortex generators on the separation bubble and the flow downstream has been examined. The simulations show that the length of the separation bubble is reduced by sixty two per cent due to the deployment of vortex generators of height 0.33δ while the original separation bubble is completely eliminated by the vortex generators of height 0.66δ . However the presence of larger height vortex generators by itself causes a small mean separation bubble downstream. The flow downstream of vortex generators is highly three-dimensional and zones of recirculation can be observed between regions of attached flow. Presence of adverse pressure gradient results in greater interaction between counter-rotating vortices, leading to their early breakup and higher vortex decay rate compared to the zero pressure gradient case. Further, it is seen from the simulations that the counter-rotating array of vortices does not move away from the wall .even far downstream

کلمات کلیدی:

Laminar separation bubble, Rectangular vortex generators, Direct numerical simulation, Immersed boundary method

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