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Author Bing-yi Chen
Author's Email Address No Public.
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Abstract
A multiple-intersecting flow network is common in biological and industrial systems such as the human vascular system, the internal coolant passage of turbine blade inside gas turbine engine, the liquid cooling channel inside electronic modules. A digital particle image velocimetry (DPIV) system has been developed to measure instantaneous and ensemble-averaged flow fields in the multiple-intersection flow networks. The effects of are investigated at various geometrical parameters and Reynolds number the Coanda effect. The flow at each intersection is characterizes by a collision of two flow streams, resulting in vortexes on the two sides of the diamond-shaped island in the post-intersecting region of the network. It is noticed that the vortex on one side increases, at the same time the vortex on the other side decreases with the flip-flop flow at the exit end of the flow networks. The study also found the larger vortex places on interlacing sides of the island between the two rows along the downstream direction. This new has not been discloses in the existed literatures.
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