World Academy of Science, Engineering and Technology
International Journal of Computer and Systems Engineering
Vol:11, No:02, 2017

Flow Field Analysis of a Liquid Ejector Pump Using Embedded Large Eddy Simulation Methodology

Authors : Qasim Zaheer, Jehanzeb Masud

Abstract : The understanding of entrainment and mixing phenomenon in the ejector pump is of pivotal importance for designing and performance estimation. In this paper, the existence of turbulent vortical structures due to Kelvin-Helmholtz instability at the free surface between the motive and the entrained fluids streams are simulated using Embedded LES methodology. The efficacy of Embedded LES for simulation of complex flow field of ejector pump is evaluated using ANSYS Fluent®. The enhanced mixing and entrainment process due to breaking down of larger eddies into smaller ones as a consequence of Vortex Stretching phenomenon is captured in this study. Moreover, the flow field characteristics of ejector pump like pressure velocity fields and mass flow rates are analyzed and validated against the experimental results.

Keywords : Kelvin Helmholtz instability, embedded LES, complex flow field, ejector pump
Conference Title : ICCFD 2017 : International Conference on Computational Fluid Dynamics
Conference Location : Barcelona, Spain
Conference Dates : February 26-27, 2017