

Numerical Simulation of Multiple Arrays Arrangement of Micro Hydro Power Turbines

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Abstract : River flow over micro hydro power (MHP) turbines of multiple arrays arrangement is simulated with computational fluid dynamics (CFD) software to obtain the flow characteristics. In this paper, CFD software is used to simulate the water flow over MHP turbines as they are placed in a river. Multiple arrays arrangement of MHP turbines lead to generate large amount of power. In this study, a river model is created and simulated in CFD software to obtain the water flow characteristic. The process then continued by simulating different types of arrays arrangement in the river model. A MHP turbine model consists of a turbine outer body and static propeller blade in it. Five types of arrangements are used which are parallel, series, triangular, square and rhombus with different spacing sizes. The velocity profiles on each MHP turbines are identified at the mouth of each turbine bodies. This study is required to obtain the arrangement with increasing spacing sizes that can produce highest power density through the water flow variation.

Keywords : micro hydro power, CFD, arrays arrangement, spacing sizes, velocity profile, power

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