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Parametric analyses of wind funnel concentrator

Salih N Akour and Hani Omar Bataineh
The University of Jordan, Jordan

This research is intended to study the performance of Wind Funnel Concentrator System that captures wind flow from any direction by a large intake, funnels it down using tapered pipes leading to a concentrator that ends in Venturi section where the turbine should be placed. This Wind Concentrator system is called INVELOX machine. Parametric design analysis is carried out to obtain the optimum design parameters of the Wind Concentrator to maximize the wind speed at the venturi section. The parameters considered are the intake shape and size, guided vanes number and its extend, elbow size, venture length, and wind direction. The design and simulation is carried out

using ANSYS software package. The obtained results of venturi air speed values show that the intake area is directly proportional to venturi air speed and it inversely proportional to the size of the venturi cross sectional area as well as the venturi cross section length. It is also found that the highest venturi air speed is obtained when the system body orientation is aligned with the wind direction within a tolerance of $\pm 45^\circ$. The best performance achieved when the final shape of Wind Concentrator has five guided vanes extended to the end of the funnel length. The Velocity of wind at the Venturi throat is found to increase by more than four times of the intake speed.

Biography

Salih N Akour is a Professor of mechanical engineering systems, at the Mechanical Engineering Department in The University of Jordan. He is a member of Phi Kappa Phi Honor Society, Golden Key Honor Society, and honorary member of International Distinguished Scholar. He has received his PhD in mechanical systems from University of Central Florida (UCF), USA in 2000. He granted in 2014 the "Asian Education Leadership Award". He is editorial board member of some international Scientific Journals and member of many organizing international conferences committees. He served as consultant for many international companies in USA, UAE and Oman.

akour@ju.edu.jo