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## Dual-rotor vertical axis wind turbine mounted on houses

Khaled Asfar, M Nazzal, M Arafat, A Musleh and A Za'reer  
Jordan University of Science and Technology, Jordan

The idea here is to utilize the high velocity wind that develops when wind blows over the inclined roof of individual home (Venturi effect). A dual-rotor wind turbine is mounted on a vertical axis on the highest point in a house. This design consists of two rotors, each rotor has three blades 120° away from each other, there is a space between the two rotors, the blade geometry and the turbine design is shown in the figure below. A vertical axis wind turbine is also mounted on the same shaft such that their combined torque is used to generate electricity from a generator on the same axis below the dual-rotors. This design has been chosen after numerically experimenting with several designs of horizontal rotor blades. The blades have been designed using Creo elements/pro engineer program. The proposed wind turbine has been tested numerically using the CFD program; XFLOW. The horizontal tangential forces on the blades were calculated by a function viewer. First, the forces  $F_x$  and  $F_z$  were evaluated. Second, the resultant forces and torque exerted by the blades on the vertical shaft are calculated. Finally, the effect of introducing this dual-rotor turbine on the power generated by the upper vertical wind turbine is investigated.

### Biography

Khaled Asfar is a Professor in Mechanical Engineering/JUST University. He is the Founder of Innovation Center and Technological Incubator at the University. He has been a visiting scholar at Aerospace Engineering/Texas A and M University (2007-2008) and a visiting Professor in Mechanical Engineering/Purdue University (2008-2010). He received his PhD degree from Virginia Tech in 1980. He was awarded several scientific honors and awards such as the Alexander von Humboldt Research Fellowship (1991-1992). He published numerous articles in several fields and holds five US patents and patent pending applications. He is an Associate Editor for *Journal of Vibration and Control*.

kasfar@just.edu.jo

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