

Wind Power Extraction by Fluctuating Wing

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Abstract

Mankind is continually searching for new sources of energy or methods to improve the known sources. Recently there is a great interest for enlargement to renewable Application, which can supply us with the energy at low-pollution. One of these important resources is wind energy.

This research refers to a new system to extract the energy of low speed winds; it works by fluttering wing with oscillating motions. The study includes the characteristic and performance of the system and its ability to extract convincing amount of the wind energy. A considerable amount of experimental work was done on prototype model at different wind speeds, to verify the idea and to define the effective parameters of the system. The performance was compared with an equivalent small horizontal axis wind turbine.

Experimental results show that the performance of the system was optimal at low wind speeds in comparison with the other wind turbines that required elevated wind speeds to start, which are not available in all Arab countries, so this system will be suitable for the available wind conditions in these countries.

The experimental results show that the performance of this system at wind speeds more than 6 m/s was relatively low because of the control aspect's difficulty on the wing's oscillating motion, so that the control mechanism of the system required better design to elevate performance of the system at higher wind speeds.

For the paper in Arabic see pages (13-21)

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