**Augmentation of the basin type solar still using photovoltaic powered turbulence system**

**A.E. Kabeela, Mofreh. H. Hamedb and Z.M. Omarac**

a Mechanical Power Engineering Department, Faculty of Engineering,

Tanta University, Tanta, Egypt.

b Mechanical Engineering Department, Faculty of Engineering, IUM, KSA

c Mechanical Engineering Department, Faculty of Engineering,

Kafrelsheikh University, Kafrelsheikh, Egypt.

kabeel6@hotmail.com

**A b s t r a c t**

The present paper concerns with enhancing productivity of basin type solar still through experimental investigation. Therefore, two solar stills are designed and constructed to study the performance of two suggested solar desalination systems. The first one is a conventional still and the second is a modified still uses a rotating fan with a vertical shaft. A DC-Motor powered by a small photovoltaic (PV) system is used to rotate the fan. The influence of the rotational speed of the fan and the depth of saline water on the performance of the still is investigated experimentally. The experiments were conducted with fan rotational speeds of 30, 35, 40 and 45 rpm and saline water depths of 1, 3, 5 and 7 cm. The results indicate that the daily productivity of still increases with increasing rotational speed of the fan and the maximum difference of daily productivity between fan and conventional solar stills is achieved at depth of saline water of 3 cm (with rotation). Also it is found that using rotating fan in the solar still increases the productivity by 25% at 3 cm and 45 rpm. In this case the daily efficiency and estimated cost of 1 l of distillate for fan and conventional solar stills are approximately 38 %–0.0447 $ and 35.5 %–0.049 $ respectively.

*Keywords*: Basin solar still; Solar still efficiency; Solar desalination; Productivity enhancement; Fan