

## ***Interactive comment on “Factorial design of experiment (DOE) for modeling solar still parameters” by Malik Al-Abed Allah et al.***

**Anonymous Referee #1**

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This article deals with the optimization of solar still parameters. The authors used the design of experiment (DOE) method to study the effect of many parameters on the performance of the solar still system. Theoretically, they found that basin area, saline water depth, and solar radiation are the most important factors that affect solar still productivity, while the insulation thermal conductivity, ambient temperature, and glass thickness do not affect the performance of the system. The following comments must be covered: (1) In the title: authors should avoid using abbreviations in the title. (2) In the Abstract: # Line 50: optimization of the solar still system is complex and not the system itself. This sentence should be rephrased. # Line 53: basin area, saline water depth, and solar radiation are many factors, not one factor. Authors point out them as singular. This sentence should be corrected and rephrased. (3) In the introduction:

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# Numbering of reference was missed after reference number 3. Authors must check that before submitting the manuscript in the whole manuscript!. # Line 153, There is a description for many covers of still and at the end, the result is that the maximum productivity with the still of one glass cover. This part must be summarized. # Line 165, the name of materials is missed. Abbreviations only are not acceptable. # Authors must describe the novelty of this research work. Is some research articles used DOE to optimize these parameters before or not ?. This is missed in the Introduction section.

(4) In Methodology: # In Table 1, the authors should describe how the design space was chosen. How to prove the condition corresponds to the maximum productivity determined in the current design space is the optimum condition in the entire parameter space?. It could not be left to the experience as it is written in Line 228. # Line 256,  $T_g$ ,  $T_w$ , and  $T_b$  are not defined. # Line 257, the differential equations do not exist in the manuscript or even in a supporting information file.

(5) In Results: # The title of this section should be “Results and Discussion”. # Line 267, where are these mathematical formulas? # Sections 3.1, 3.2., and 3.4., there is no discussion for the obtained results. Also, there is no explanation and comparison from the literature with what the authors find. # Fig. 5b, “d” letter is missed in distilled water. # English of the manuscript must be revised. # Generally, No discussion in this article for the obtained results. Also, by the DOE method, you decrease the number of experiments to optimize the process. I could not see any description for experiments done to have the responses. Also, there is no confirmation for the obtained results numerically by doing at least one experiment with the solar still referred by the authors.

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