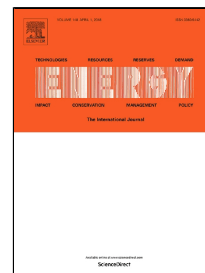


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Evaluation of the performance and degradation of crystalline silicon-based photovoltaic modules in the Saharan environment

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1 Evaluation of the performance and degradation of crystalline silicon-based  
2 photovoltaic modules in the Saharan environment

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15  
16 **Abstract**

17 The aim of this paper is to present three years of an evaluation of the performance  
18 and degradation rate of three different crystalline silicon-based photovoltaic (PV)  
19 modules in the Saharan environment. The PV modules are: mc-Si (multi-  
20 crystalline), c\_Si (mono-crystalline, back contacted) and HiT (heterojunction with  
21 intrinsic thin-layer); they are installed in Saida which is located at the proximity of  
22 Algeria's Sahara. Two methods were used to calculate the degradation rate; the  
23 effective peak power of the PV modules and the temperature corrected  
24 performance ratio. It was found that the HIT technology performs worse than the  
25 other technologies with the highest degradation rate, ranging from -1.53%/year to  
26 -1.92%/year. The mc\_Si PV and c\_Si PV module technologies present a lower  
27 degradation rate than the HIT technology in the range of -0.74 %/year to -0.83  
28 %/year and -0.58 %/year to -0.79 %/year respectively.

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