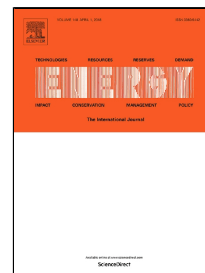


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Evaluation of the performance and degradation of crystalline silicon-based photovoltaic modules in the Saharan environment

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1 Evaluation of the performance and degradation of crystalline silicon-based
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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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