



Degradation evaluation of crystalline-silicon photovoltaic modules after a few operation years in a tropical environment

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Résumé en anglais	<p>This paper presents an evaluation of the performance degradation of Photovoltaic modules after few operation years in a tropical environment. To this end, the International Center for Research and Training in solar energy at Dakar University and the Lasquo-ISTIA laboratory of Angers University have put in place a research project in order to investigate the impact of the tropical climatic conditions on the PV modules characteristics. Accordingly, two monocrystalline-silicon (mc-Si) PV modules and two polycrystalline-silicon (pc-Si) PV modules are installed at Dakar in Senegal and monitored during a few operation years: Module A (16 months), Module B (41 months), Module C (48 months) and Module D (48 months). After few operation years under tropical environment, the global degradation and the degradation rate of electrical characteristics such as I-V and P-V curves, open-circuit voltage (V_{oc}), short-circuit current (I_{sc}), maximum output current (I_{max}), maximum output voltage (V_{max}), maximum power output (P_{max}) and fill factor (FF) are evaluate at standard test conditions (STC). This study reports on data collected from 4 distinct mono- and polycrystalline modules deployed at Dakar University in Senegal. The study has shown that P_{max}, I_{max}, I_{sc} and FF are the most degraded performance characteristics for all PV modules. The maximum power output (P_{max}) presents the highest loss that can be from 0.22%/year to 2.96%/year. However, the open-circuit voltage (V_{oc}) is not degraded after these few exposition years for all studied PV modules.</p>
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- [1] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=9217>
- [2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=9218>
- [3] <http://okina.univ-angers.fr/abderafi.charki/publications>
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