



## Impact of the aging of a photovoltaic module on the performance of a grid-connected system

Submitted by Abdérafi Charki on Fri, 10/18/2019 - 15:47

Titre	Impact of the aging of a photovoltaic module on the performance of a grid-connected system
Type de publication	Article de revue
Auteur	Azizi, Amina [1], Logerais, Pierre-Olivier [2], Omeiri, Amar [3], Amiar, Adel [4], Charki, Abderafi [5], Riou, Olivier [6], Delaleux, Fabien [7], Durastanti, Jean-Félix [8]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2018
Langue	Anglais
Date	1er Novembre
Pagination	445-454
Volume	174
Titre de la revue	Solar Energy
ISSN	0038-092X
Mots-clés	Aging [9], Passive filter [10], photovoltaic system [11], Power degradation [12]
Résumé en anglais	<p>Photovoltaic systems belong to the green energy dynamics which is an ambitious program based on energy efficiency and sustainable development. In this study, the impact of the aging of a photovoltaic module is investigated on the electrical performance of a grid-connected system. A photovoltaic conversion chain with MPPT (Maximum Power Point Tracking) control and LC (Inductor-Capacitor) filter is modeled and dimensioned according to the grid constraints. A method of hybridation detection of the MPPT coupling long-time aging evolution and short-time determination is proposed. Aging laws for the electrical and optical degradations of the photovoltaic module are introduced for the long-time evolution. Results display the lowering of the maximal power point with a rate of 1%/year and a slight augmentation of the THD over time even though it remains inferior to the IEEE standard STD 19-1992 maximum value of 5% for a usage of 20 years. Moreover, an equivalent scheme for the additional electrical resistance engendered by the aging of the photovoltaic module regarding other resistances of the photovoltaic system is given. Finally, the elevation of this resistance by 12.8% in 20 years may have non-negligible consequences on the power production of a large-scale installation. © 2018</p>
URL de la notice	<a href="http://okina.univ-angers.fr/publications/ua20367">http://okina.univ-angers.fr/publications/ua20367</a> [13]
DOI	<a href="https://doi.org/10.1016/j.solener.2018.09.022">10.1016/j.solener.2018.09.022</a> [14]
Lien vers le document	<a href="https://www.sciencedirect.com/science/article/abs/pii/S0038092X18308934?...">https://www.sciencedirect.com/science/article/abs/pii/S0038092X18308934?...</a> [15]

---

### Liens

- [1] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=40059>
- [2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=17258>
- [3] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=40060>
- [4] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=40061>
- [5] <http://okina.univ-angers.fr/abderafi.charki/publications>
- [6] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=17252>
- [7] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=40063>
- [8] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=40064>
- [9] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=1320>
- [10] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=29600>
- [11] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=16362>
- [12] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=29599>
- [13] <http://okina.univ-angers.fr/publications/ua20367>
- [14] <http://dx.doi.org/10.1016/j.solener.2018.09.022>
- [15] <https://www.sciencedirect.com/science/article/abs/pii/S0038092X18308934?via%3Dihub>

Publié sur *Okina* (<http://okina.univ-angers.fr>)