

Record 1 of 1**Title:** Novel battery wear leveling method for large-scale reconfigurable battery packs**Author(s):** Carstoiu, G (Carstoiu, Gabriel); Micea, MV (Micea, Mihai V.); Ungurean, L (Ungurean, Lucian); Marcu, M (Marcu, Marius)**Source:** INTERNATIONAL JOURNAL OF ENERGY RESEARCH **Volume:** 45 **Issue:** 2 **Pages:** 1932-1947 **DOI:** 10.1002/er.5879 **Early Access Date:** SEP 2020 **Published:** FEB 2021**Times Cited in Web of Science Core Collection:** 0**Total Times Cited:** 0**Usage Count (Last 180 days):** 9**Usage Count (Since 2013):** 14**Cited Reference Count:** 48

Abstract: As the market and the application areas of high capacity battery energy storage systems are rapidly increasing, there is a correspondingly high interest in the topic of minimizing battery state of health degradation in battery packs. In this article, a novel method for battery management in large-scale battery packs is introduced, aiming to minimize battery degradation by enforcing a special wear leveling (WL) policy, adapted from the flash memory arrays. Using this method in conjunction with a hybrid mathematical-electrochemical battery model, a reconfigurable battery management system (BMS) is proposed and evaluated. The results of the performance analysis and in-depth comparisons with other state-of-the-art solution shows that the proposed method achieves significantly longer operating times for the battery packs-for example, 415% improvement over the classical BMS in the load current variation scenario. As the computing and memory requirements are relatively low, the new battery WL method can also be implemented on embedded systems with limited resources.

Accession Number: WOS:000566702500001**Language:** English**Document Type:** Article**Author Keywords:** battery; large-scale battery pack; reconfigurable battery management system; state of health; wear leveling**KeyWords Plus:** MANAGEMENT-SYSTEM; MODEL; OPTIMIZATION; RELIABILITY; DURABILITY; DESIGN; STATE**Addresses:** [Carstoiu, Gabriel; Micea, Mihai V.; Ungurean, Lucian; Marcu, Marius] Politehn Univ Timisoara, Dept Comp & Informat Technol, Timisoara, Romania.**Corresponding Address:** Micea, MV (corresponding author), Politehn Univ Timisoara, Dept Comp & Informat Technol, Timisoara, Romania.**E-mail Addresses:** mihai.micea@cs.upt.ro**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Cârstoiu, Gabriel	ABC-1558-2020	0000-0003-0998-4010

Publisher: WILEY**Publisher Address:** 111 RIVER ST, HOBOKEN 07030-5774, NJ USA**Web of Science Index:** Science Citation Index Expanded (SCI-EXPANDED)**Web of Science Categories:** Energy & Fuels; Nuclear Science & Technology**Research Areas:** Energy & Fuels; Nuclear Science & Technology**IDS Number:** PVOLJ**ISSN:** 0363-907X**eISSN:** 1099-114X**29-char Source Abbrev.:** INT J ENERG RES**ISO Source Abbrev.:** Int. J. Energy Res.**Source Item Page Count:** 16**Output Date:** 2022-03-05