

Battery anti-aging



Overview

This paper proposes a hierarchical optimization energy management strategy to suppress the battery aging in plug-in hybrid electric vehicles. In the first-level, a variable-threshold dynamic programming algorithm to. ••A method are proposed to improve fuel economy while suppressing battery a. CTF cycles to failurePED pure electric drivingCTUDC. As the energy shortage is becoming increasingly serious (Sedighizadeh et al., 2018, Zhang et al., 2018, Li et al., 2018a, Yang et al., 2017a), there is an urgent need to find alternative. 2.1. PHEV configurationA single-axis series-parallel PHEV is investigated in this paper, and its typical powertrain configuration is shown in Fig. 1(a), which is con. 3.1. First-level optimization: variable-threshold dynamic programming (V-DP)DP is a global optimization algorithm, which is mainly used to solve the optimization problem of multi-.



Article Content

Bai, Y., He, H., Li, J., Li, S., Wang, Y. & Yang, Q.

Battery anti-aging control for a plug-in hybrid electric vehicle with a hierarchical optimization energy management strategy Yunfei Baia, Hongwen Hea*, Jianwei Li*a, Shuangqi Lia, Ya-xiong Wangb, Qingqing Yangc a. Beijing Institute of technology National Engineering Laboratory for Electric Vehicles, 100081 Beijing, China b.

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To ensure fuel economy while suppressing battery aging, a novel hierarchical optimization energy management strategy is proposed in this paper which can allocate the power between engine, ...

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Fast self-heating battery with anti-aging awareness for freezing ...

In order to suppress the battery aging of electric vehicles (EVs), a multi-objective optimization function is established to describe the battery aging behavior based on a high-precision battery aging model, and the state-space equation is then constructed to reveal the intrinsic relationship between vehicle speed, acceleration, and battery ...

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An innovative multitask learning

Multi-condition anti-aging evaluation of Li-ion batteries based on the MOL-PMCLSTM model. The accuracy and robustness of the proposed MOL-PMCLSTM algorithm in SOC estimation for Li-ion batteries were verified by cyclically aging three batteries under standard constant current/constant voltage charge and discharge conditions at 25 °C. Data from ...

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Fast self-heating battery with anti-aging awareness for freezing ...

Request PDF | Fast self-heating battery with anti-aging awareness for freezing climates application | Lithium-ion batteries (LIBs) need to be heated before use at low temperatures to avoid poor ...

Review of Cell Level Battery (Calendar and Cycling) Aging ...

Electrochemical battery cells have been a focus of attention due to their numerous advantages in distinct applications recently, such as electric vehicles. A limiting factor for adaptation by the industry is related to the aging of batteries over time. Characteristics of battery aging vary depending on many factors such as battery type, electrochemical reactions, ...

Fast self-heating battery with anti-aging awareness for freezing ...

To sum up, it is challenging to design a heating method that can weigh the system complexity, heating speed and the resultant battery aging. To bridge these gaps, this ...

Optimization of Bi-Directional V2G Behavior With Active Battery Anti ...

A novel active battery anti-aging V2G scheduling approach that can minimize battery charge/discharge cycles by optimizing the time and scale of each V1G participant while providing the same services to the grid as expected is proposed. The bi-directional linkage between the power grid and electric vehicles (EVs) enables flexible, cheap and fast-responding ...

Aging Mitigation for Battery Energy Storage System in ...

battery aging. This paper proposes an integrated battery life loss modeling and anti-aging energy management (IBLEM) method for improving the total economy of BESS in EVs. The ...

The active battery anti-aging V2G scheduling method.

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Battery anti-aging control for a plug-in hybrid electric vehicle with ...

Considering the initial cost of the supercapacitor, the costs of battery aging, fuel consumption, electricity consumption, and management cost of retired batteries, compared with the global dynamic programming algorithm, the life cycle economy of the vehicle is improved by 12.4% under the proposed method.

Battery anti-aging control for a plug-in hybrid electric vehicle with ...

Battery anti-aging control strategy with a hierarchical optimization approach is illustrated in section 3. Then, section 4 introduces life cycle economic analysis method based on rain-flow counting algorithm. In section 5, the results and discussion will be illustrated. Conclusions are drawn in section 6.

Fast self-heating battery with anti-aging awareness for free

Lithium-ion batteries (LIBs) need to be heated before use at low temperatures to avoid poor electric vehicle performance. In this study, a self-heating method for LIBs at low temperatures is proposed, ... "Fast self-heating battery with anti-aging awareness for freezing climates application," Applied Energy, Elsevier, vol. 324(C). Handle: RePEc ...

Online Optimization of Vehicle-to-Grid Scheduling to Mitigate Battery Aging

The penetration of electric vehicles (EVs) in vehicle-to-grid (V2G) interaction can effectively assist the grid in achieving frequency regulation and peak load balancing. However, the customer perceives that participating in V2G services would result in the additional cycling of the battery and the accelerated aging of the EVs' power battery, which has become a major ...

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Invasive battery aging detection methods refer to those that require disassembly or intervention of the battery. These methods evaluate the degree of battery aging and ...

Battery anti-aging control for a plug-in hybrid electric vehicle with ...

Firstly, to evaluate the battery aging effect in V2G service, the battery degradation phenomenon is quantified by a novel use of rain-flow cycle counting (RCC) algorithm.

Fast self-heating battery with anti-aging awareness for freezing ...

DOI: 10.1016/j.apenergy.2022.119762 Corpus ID: 251480330; Fast self-heating battery with anti-aging awareness for freezing climates application
@article{Xiong2022FastSB, title={Fast self-heating battery with anti-aging awareness for freezing climates application}, author={Rui Xiong and Zhengyang Li and Ruixin Yang and Weixiang Shen and Suxiao Ma and Fengchun Sun}, ...

Aging Mitigation for Battery Energy Storage System in ...

Some references have investigated off-line battery anti-aging BESS energy management approaches. In , the rain-flow cycle counting algorithm is used to analyze aging cycles in a grid-connected battery storage system. The proposed method enables distribution network operators to optimally ...

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Shuangqi Li

Battery anti-aging control for a plug-in hybrid electric vehicle with a hierarchical optimization energy management strategy. Y Bai, H He, J Li, S Li, Y Wang, Q Yang. Journal of Cleaner Production 237, 117841, 2019. 75: 2019:

Optimization of Bi-Directional V2G Behavior With Active ...

battery anti-aging V2G scheduling method are described in Section IV. Results and comparisons are provided in Section V, followed by concluding remarks in Section VI.

II. THE ACTIVE BATTERY ANTI-AGING V2G SCHEDULING SYSTEM

The framework of the proposed battery anti-aging V2G scheduling system is shown in Fig. 1.

Optimization of Bi-Directional V2G Behavior with Active Battery Anti ...

This paper proposes a novel active battery anti-aging V2G scheduling approach. Firstly, to evaluate the battery aging effect in V2G service, the battery degradation phenomenon is quantified by a novel use of rain-flow cycle counting (RCC) algorithm. Then, the V2G scheduling is modeled as a multi-objective optimization problem, in which the ...

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Optimization of Bi-Directional V2G Behavior with Active Battery Anti ...

However, the battery aging effects due to the additional operation cycles caused by Vehicle-to-Grid (V2G) service and the concern of the battery degradation are the main reason that keeps the customer from being the named prosumer of the grid. This paper proposes a novel active battery anti-aging V2G scheduling approach. Firstly, to evalu

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Aging mechanisms, prognostics and management for lithium-ion batteries ...

Understanding the mechanisms of battery aging, diagnosing battery health accurately, and implementing effective health management strategies based on these diagnostics are recognized as crucial for extending battery life, enhancing performance, and ensuring safety. Firstly, a comprehensive grasp of battery aging mechanisms forms the foundation for ...

Optimization of Bi-Directional V2G Behavior with Active ...

This paper proposes a novel active battery anti-aging V2G scheduling approach. Firstly, to evaluate the battery aging effect in V2G service, the battery degradation phenomenon is quantified by a ...

Battery anti-aging control for a plug-in hybrid electric vehicle with ...

This paper proposes a hierarchical optimization energy management strategy to suppress the battery aging in plug-in hybrid electric vehicles. In the first-level, a variable-threshold dynamic programming algorithm to distribute the power between ...

Understanding, Preventing, and Managing Battery Aging

Over the lifetime of a battery, a variety of aging mechanisms affect the performance of the system. Cyclic and calendar aging of the battery cells become noticeable as a loss of capacity and an increase in internal ...

An improved vehicle to the grid method with battery longevity ...

The EV battery anti-aging control is one of the main contributions of the proposed V2G method, whereas the battery lifetime performance should be evaluated available in a long duration. Therefore, this study takes advantage of the real case of the microgrid in Belgium and builds the long-term V2G simulation model based on the real data in the ...

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