

Adaptive Predefined-Time Backstepping Control for Grid Connected Photovoltaic Inverter. Jiarui Zhang 1, Dan Liu 2,\* , Kan Cao 2, Ping Xiong 2, Xiaotong Ji 3, Yanze Xu 1, Yunfei Mu 1. 1 Key Laboratory of Smart Grid of Ministry of Education, Tianjin University, Tianjin, 300072, China 2 State Grid Hubei Electric Power Research Institute, Wuhan, 430077, China 3 State Grid Hubei ...

This paper develops the linear mathematical model of a single machine infinite bus system integrated by the PV grid-tied inverter under the electromechanical time scale, and shows that enlarging the proportional-integral-derivative (PID) controller parameters can effectively change electromagnetic power distribution to suppress the imbalance power, and equivalently improve ...

As the traditional resources have become rare, photovoltaic generation is developing quickly. The grid-connected issue is one of the most importance problem in this field. The voltage source inverter usually uses LC or LCL as the filter. LCL filter, which can reduce the required filtered inductance and save the cost, is adopted to connect the grid in this paper. ...

Arc faults threaten the safe operation of photovoltaic (PV) systems. An arc fault detection and localization approach using parallel capacitors is proposed. A PV system has been analyzed and tested with five capacitors paralleled with the branches in the system. Series and parallel arc faults at nine locations have been tested in the system. When an arc occurred, ...

In bulk power systems, synchronous generators (SGs) regulate the grid frequency and voltages. The per-unit kinetic energy (defined as inertia) of SGs plays a vital role on the regulation of frequency. Driven by the desire for clean electricity, modern grids witness an energy transition from fossil fuels to renewable energies. However, renewable energy sources ...

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DOI: 10.23919/cjee.2018.8606786 Corpus ID: 201136960; Review of power decoupling methods for micro-inverters used in PV systems @article{Zhang2018ReviewOP, title={Review of power decoupling methods for micro-inverters used in PV systems}, author={Yonggao Zhang and Jian Xiong and Peng He and Shuai Wang}, journal={Chinese Journal of Electrical Engineering}, ...

, Xiong Liu. 3. and. Ariya Sangwongwanich. 2. 1. ... PV inverters with the same design metrics (e.g., component selection) may become over- or under-designed under different mission profiles. This ...

DC arc faults are dangerous to photovoltaic (PV) systems and can cause serious electric fire hazards and

property damage. Because the PV inverter works in a high-frequency pulse width modulation (PWM) control mode, the arc fault detection is prone to nuisance tripping due to PV inverter noises. An arc fault detection method based on the ...

This work presents the photovoltaic Micro Inverter Systems (MIS) and its control techniques. The Micro Inverter is the combination of a boost-half-bridge DC-DC converter and full bridge pulse width-modulated inverter. The boost-half-bridge converters results in minimal number of semiconductor devices and low cost. The IIR filter is used to reduce the total harmonic ...

Frequency trajectory planning based strategy for improving frequency stability of droop-controlled inverter based standalone power systems ... Y Li, Z Xu, L Xiong, G Song, J Zhang, D Qi, H ...

The proposed strategy provides an optimal control framework for the rooftop PV inverters to maintain voltage within the normal range under varying active power generated by the PV systems, and simulation results verify that the total reactive power output of the PV inverter can be effectively reduced. Due to the mismatch between the residential electrical load and ...

This paper takes the single phase grid-connected inverter as the research object, and designs the double closed-loop control system based on active-disturbance-rejection control (ADRC). It builds the system model, simulates on Matlab/Simulink platform, and compares the simulation results with that of PID control strategy. It also analyzes the influence of ...

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Photovoltaic systems are widely used due to their low maintenance cost and not polluting the environment. In this paper, parameter estimation, phase and frequency synchronization of the single phase full-bridge PV Grid-Connected inverter is studied. System identification is the first step before control and synchronization. Selecting proper parameters ...

90.23% for a 100W system design, but control complexity is increased. S3 D3 D4 Cf Lf Grid PV D1 D2 CDC CD S4 S1 S2 Power Decoupling Circuit Figure 4. Topology proposed by Hu, et al [15]

A photovoltaic (PV) grid-connected inverter converts energy between PV modules and the grid, which plays an essential role in PV power generation systems. When compared with the single-stage PV grid-connected inverter, the two-stage type, which consists of a front-end stage dc-dc converter and a downstream stage dc-ac inverter, as shown in Fig. 1 ...

X. Xiong; A new identification and modeling method for single-phase inverter is proposed. Regarding the single-phase inverter of grid-connected photovoltaic (PV) system as a black box, only ...

Liansong Xiong is currently a Associate Professor at School of Electrical Engineering, Xi'an Jiaotong University. His research interests include power quality, renewable energy generation, and ...

A control strategy based on the low voltage ride through capability of photovoltaic inverter is presented. The control strategy is used when the grid voltage drops, which can limit the increase of active current. ... {Nie Xiong and Xie Yun-xiang and Chen Bing and Zhang Xiaoyu and He Chenyang and Zeng Zhiwu}, journal={2016 IEEE 8th International ...

In the paper by Zheng and Xiong (2013), the Wiener model of a single-phase PV inverter is constructed using the nonlinear system identification technology based on external measurement data at DC ...

The primary role of a solar inverter is to convert DC solar power to AC power. The solar inverter is one of the most important parts of a solar system and is often overlooked by those looking to buy solar energy. This review highlights the best inverters from the world's leading manufacturers to ensure your solar system operates trouble-free ...

With the large-scale distributed PV connected to the grid, the random and intermittent nature of PV output, the non-linearity of the inverter, as well as the low daytime base-load and large-scale back feeding cause outstanding power quality problems such as overvoltage, three-phase unbalance, and high harmonic content at the end of the power supply system, ...

In order to maintain the stability of microgrid system, inverters are usually needed as an important intermediate bridge to enable it to have the role of consuming new energy sources such as PV, wind and hydropower. The microgrid inverter converts the input DC power into AC power for the transmission system or microgrid, providing the flexibility.

However, the modified modulation was only designed for the single-phase PV inverter with two H-bridges, making it difficult to extend to inverters with more submodules directly. In recent years, model predictive ...

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