

Adrc grid-connected inverter





Overview

Does linear ADRC improve power quality in a grid-connected inverter?

In this study, a current control strategy was proposed based on linear ADRC for a grid-connected inverter with an LCL filter to enhance power quality. The proposed strategy handles two issues of active damping and grid voltage-induced distortion through the concept of overall disturbance rejection.

Can ADRC be used in inverter control?

Finally, the adaptability of ADRC in inverter control may be limited, particularly in the face of substantial changes in system dynamics or operating conditions. While ADRC is designed to handle uncertainties and disturbances, its response to sudden load variations or large disturbances may not always meet performance expectations.

How to control a grid-connected inverter?

Some methods of improved ADRC have been proposed to control the grid-connected inverter. In [8], a nonlinear ADRC controller is provided to control the single-phase inverter. This controller has better immunity performance than PI control, but this control is only suited for the single-phase inverters.

How is ADRC applied to power systems control?

There are several ways in which ADRC has been applied to power systems control, including: frequency and voltage regulation , load flow control , power quality improvement , and marine current turbine disturbances rejection .



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[ADRC-based symmetric phase-locked loop structure for ...](#)

Jul 9, 2024 · With a small short-circuit ratio (SCR), the grid-connected inverter is prone to low-frequency oscillation instability due to the dynamic interaction between the phase-locked loop ...

[Current control with active disturbance rejection control of ...](#)

Sep 24, 2022 · A grid-connected inverter control strategy based on immersion and invariant active disturbance rejection control was proposed in [18]. In the paper, it applies to low-order systems ...



[Optimized Active Disturbance Rejection Control with ...](#)

Sep 10, 2025 · A robust optimized active disturbance rejection control (ADRC) based grid voltage sensorless current controller is developed for an LCL-filtered grid-connected inverter (GCI) via ...

[Current control with active disturbance rejection control of ...](#)

Theorem 1. Selection of Target System Controller Design
Assumption 1. Theorem 2. Proof
Design Theorem 3. The I&I technique is a method of geometric reduction. Basic idea: Map the



object system to a lower target system and require the target system to have pre-specified performance. Therefore, the target system with more robust anti-interference performance can be selected to be immersed into the higher-order system. Then, the I&I control law is design See more on [link.springer SAGE Journals](https://link.springer.com/journal/54)

Research on the control strategy of LCL grid-connected

...

Oct 30, 2023 · To verify the application of the designed controller in the LCL grid-connected inverter, the following is a comparative analysis of PI control, ADRC and RC-ADRC for the grid ...



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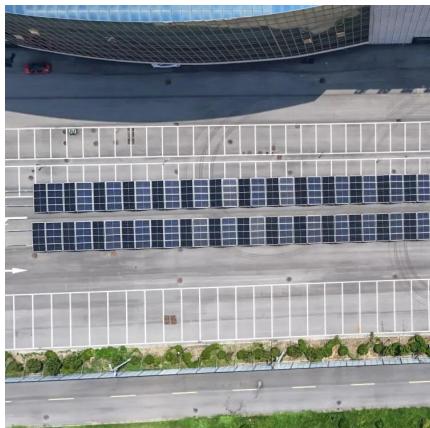
[\(PDF\) ADRC-Based Current Control for Grid-Tied Inverters: ...](#)

Oct 30, 2019 · In this paper, with LCCL filter, the order of the inverter system is degraded from third-order to first-order, and an ADRC-based current control strategy for LCCL-type grid-tied ...



[IEEE TRANSACTIONS ON POWER ELECTRONICS, VOL.](#)

Oct 23, 2025 · Abstract--Traditional active disturbance rejection control (T-ADRC) schemes for grid-connected inverters (GCI) face chal-



allenges in reference tracking accuracy and harmonic ...

Research on Grid-connected Control of Inverter Based on First Order ADRC

Jul 11, 2022 · Single-phase grid-connected inverters are widely used in residential photovoltaic grid-connected scenarios and there are load switching and environmental disturbances in the ...



Linear ADRC direct current control of grid-connected inverter ...

Jul 12, 2018 · The conversion and utilisation of renewable energy generations often require grid-connected inverters. When applying LCL filter to remove power electronic chopping ...

Active disturbance rejection control for four-wire inverters in

Jan 1, 2025 · Indeed, incorporating Active Disturbance Rejection Control (ADRC) in inverter control systems presents several noteworthy limitations that warrant consideration for ...





[Immersion and invariance disturbance rejection control ...](#)

To improve the anti-disturbance ability of LCL grid-connected inverter system, a novel immersion and invariance based on active disturbance rejection control(I& I-ADRC) scheme is proposed ...

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