
To resolve this situation, this study proposes an advanced frequency-adaptive PLL (AFA-PLL), which can work under abnormal grid frequencies or harmonics and avoid spectral leakage by ...

For a grid-connected inverter (GCI) without ac voltage sensors connected to the weak grid, the occurrence of frequency variation diminishes the accuracy of the

This study investigates the optimum sizing of the ESS to prevent under-frequency load shedding. The optimal size is determined for both droop and virtual synchronous ...

Grid-forming (GFM) inverters play a critical role in stabilizing future power grids. However, their synchronization is inherently coupled ...

In this section, a typical LCL-type grid-connected inverter system is given here as an application example of the proposed PLL, with an aim to illustrate the advantages of the ...

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The high penetration of renewable energy sources in future power grids presents stability challenges for grid-connected inverters, particularly during large frequency drops ...

Synchronization of grid-forming inverters is achieved by generating phase angles through power control, thereby mitigating the negative effects of phase-locked loops on grid ...

Simulation results demonstrate that this multi-functional strategy outperforms traditional grid-connected inverter control schemes, ...

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This approach ensures stable operation in both islanded and grid-connected modes, providing essential grid support functions such as frequency and voltage regulation. Its ...

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This research presents an Adaptive Model Predictive Control (AMPC) framework to enhance GFM performance in Virtual Synchronous Machine (VSM) mode, ensuring robust ...

Grid-forming (GFM) inverters play a critical role in stabilizing future power grids. However, their synchronization is inherently coupled with frequency support, which poses a ...

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