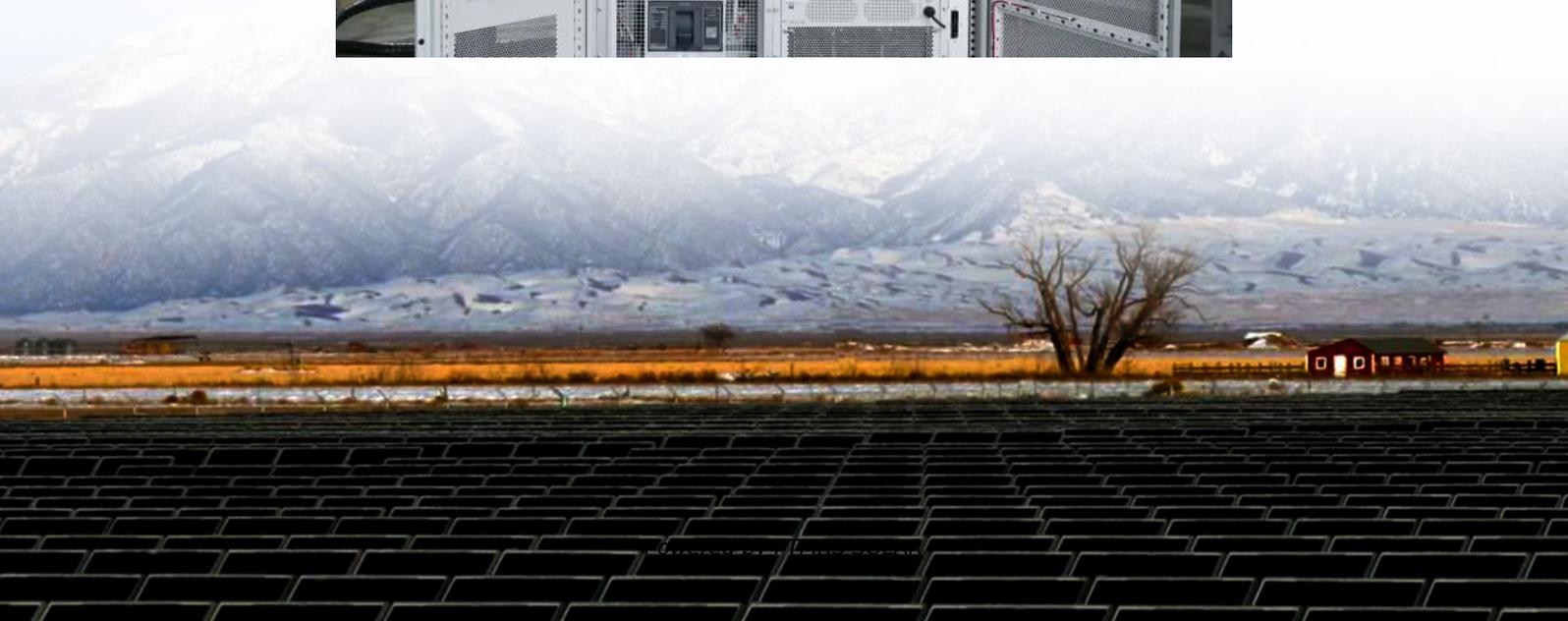


Inverter grid connection stability





Overview

Are grid-connected inverters stable under a weak grid?

The sequence impedance model of the hybrid-mode GCIs is established, and the small-signal stability is analyzed in this article. The experimental results verify the effectiveness of the proposed strategy. Grid-connected inverters (GCIs) operating in grid-following (GFL) mode may be unstable under weak grids with low short-circuit ratio (SCR).

Does grid impedance affect the stability of grid-connected inverters?

The stability analysis method based on impedance is used to analyse the influence of grid impedance on the stability of grid-connected inverters. Finally, the simulation finally proves the correctness of the analysis method.

Do grid-connected inverters have a small-signal stability region?

Therefore, it is essential to construct a small-signal stability region (SSSR) for the grid-connected inverter to analyze system stability comprehensively. Presently, the investigation of the SSSR for grid-connected inverters primarily relies on the state-space method.

How does a grid-connected multi-inverter system change stability?

As the active power of inverter 2 increases, the system transitions from stability to instability. Decreasing the active power of inverter 1 restores stability to the system. These variations in system stability are consistent with Fig. 15, confirming the applicability of the proposed algorithm to the grid-connected multi-inverter system. Fig. 14.



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