

Research on finite time control strategy of pre-synchronization VSG based on angular frequency feedback

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Abstract

In order to improve the grid-connected ability and response speed of virtual synchronous generator (VSG), a finite-time control strategy of pre-synchronous VSG based on angular frequency feedback is proposed in this paper. Firstly, the basic principle of VSG control strategy is analyzed, and the voltage amplitude pre-synchronization module and the voltage phase pre-synchronization module are added on the basis of traditional VSG control, so as to realize the pre-synchronization tracking of power grid information. Then, based on the principle of finite-time stability, a finite-time controller is designed based on angular frequency feedback, and the finite-time stability of the control strategy is verified in theory to ensure the system has a faster response speed. Finally, the simulation results show that the designed control strategy can make the output voltage of VSG track the power grid information quickly, and effectively improve the tracking ability of active and reactive power and the stability of frequency and phase angle.

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