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## **A Unified Startup Strategy for Modular Multilevel Converters with Deadbeat Predictive Current Control**

a simple and effective startup strategy for MMCs based on a deadbeat predictive current control is proposed. This strategy can realize a fast precharge for all the SM capacitors from both ac-side or dc-side main voltages without any inrush current, and thus guarantees a rapid and safe startup of MMCs. With the developed strategy, precharge currents from both ac-side and dc-side can be easily regulated in a closed-loop manner with an excellent dynamic performance. Moreover, conventional controller design and parameter tuning are not necessary, which greatly reduces design burdens and structure complexities of the control algorithm, and consequently facilitates its implementations. Detailed design processes and considerations of the proposed startup strategy are introduced and analyzed

**Domain:** Power Electronics / Multilevel Converters

**Technology:** Electrical