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Title: Current Control for Interleaved Boost Converter under CCM-DCM operation in a PV system

Abstract:

DC-DC boost converters are widely adopted in power conditioning systems for renewable energy sources (RESs) and, due to unidirectional power transfer are subject to operation in either continuous conduction mode (CCM) or discontinuous conduction mode (DCM). Current controllers that ensure operation in both modes have been developed, however, most of the solutions presented in the literature are developed for power-factor (PFC) correction rectifiers, limiting their application to other systems. In a two-stage photovoltaic (PV) generation system, the boost converter operates in a wide range of input voltages, resulting in DCM under low irradiance conditions or during system startup. An average current estimation method that provides similar performance to the current reference tracking regardless of the operation mode is presented. Results summarize the effectiveness of the controller in both operating modes.

Keywords:

DC-DC boost converter, continuous current mode, discontinuous current mode