

Robust Control of a Single-Phase Inverter Using Linear Matrix Inequality Approach

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Abstract : This paper presents a robust control strategy for a single-phase DC-AC inverter with an output LC-filter. An all-pass filter is utilized to create an artificial β -signal so that the proposed controller can be simply used in dq-synchronous frame. The proposed robust controller utilizes a state feedback control with integral action in the dq-synchronous frame. A linear matrix inequality-based optimization scheme is used to determine stabilizing gains of the controllers to maximize the convergence rate to steady state in the presence of uncertainties. The uncertainties of the system are described as the potential variation range of the inductance and resistance in the LC-filter.

Keywords : single-phase inverter, linear matrix inequality, robust control, all-pass filter

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