

Fast Terminal Synergetic Converter Control

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Abstract : A new robust finite time synergetic controller is presented based on recently developed synergetic control methodology and a terminal attractor technique. A Fast Terminal Synergetic Control (FTSC) is proposed for controlling DC-DC buck converter. Unlike Synergetic Control (SC) and sliding mode control, the proposed control scheme has the characteristics of finite time convergence and chattering free phenomena. Simulation of stabilization and reference tracking for buck converter systems illustrates the approach effectiveness while stability is assured in the Lyapunov sense and converse Lyapunov results involving scalar differential inequalities are given for finite-time stability.

Keywords : dc-dc buck converter, synergetic control, finite time convergence, terminal synergetic control, fast terminal synergetic control, Lyapunov

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