

Particle Swarm Optimisation of a Terminal Synergetic Controllers for a DC-DC Converter

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Abstract : DC-DC converters are widely used as reliable power source for many industrial and military applications, computers and electronic devices. Several control methods were developed for DC-DC converters control mostly with asymptotic convergence. Synergetic control (SC) is a proven robust control approach and will be used here in a so-called terminal scheme to achieve finite time convergence. Lyapunov synthesis is adopted to assure controlled system stability. Furthermore particle swarm optimization (PSO) algorithm, based on an integral time absolute of error (ITAE) criterion will be used to optimize controller parameters. Simulation of terminal synergetic control of a DC-DC converter is carried out for different operating conditions and results are compared to classic synergetic control performance, that which demonstrate the effectiveness and feasibility of the proposed control method.

Keywords : DC-DC converter, PSO, finite time, terminal, synergetic control

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