Abstract

In this paper a novel method of controller design for boost type dc-dc converter is proposed. DC/DC converters are widely used in photovoltaic generating systems as an interface between the photovoltaic panel and the load. Therefore, a better possible control technique is required in order to control the variation in output voltage of DC/DC converter due to the variation occurring in the external dynamics input parameters such as radiation, temperature and internal impedance of the photovoltaic (PV) module. In this paper, two paralleled DC/DC converter with a closed loop PWM based control is simulated to obtain constant output voltage. The optimal values of feedback PID controller are obtained using Particle Swarm Optimization Algorithm.
Paralleled DC Boost Converters with Feedback Control using PSO Optimization Technique for Photovoltaic Module Application

(PSOA). Extensive simulation result is found out with linear controller parameters and the same are presented here. Here comparison of the output of the PSOA based design and design of PID controller with transient performance specification (T-PID) for under-damped system is done. The PSO based tuning of PID controller is much better as determined by the simulation results.

References

- A current and future study on non-isolated DC–DC converters for photovoltaic applications, M. H. Taghvae a,n, M. A. M. Radzi a, S. M. Moosavain b, HashimHizam a,M. Hamiruce Marhaban.
- Leping Guo, John Y. Hung and R. M. Nelms,: &apos;o; Comparative Evaluation of Linear PID and Fuzzy Control for a Boost Converter,&apos;o ; IECON 2005, 31ST IEEE conference publication.
- M. Elshaer, A. Mohamed, and O. Mohammed &apos;o; Smart Optimal Control of DC-DC Boost Converter in PV Systems&apos;o ; T&D-LA, 2010 IEEE/PES, PP. 403-410, IEEE conference publication.
- H. fang and L. Chen,: &apos;o; Application of an enhanced PSO algorithm to optimal tuning of PID gains&apos;o ; CCDC 2009, China, PP. 35-39, IEEE conference publication.
Paralleled DC Boost Converters with Feedback Control using PSO Optimization Technique for Photovoltaic Module Application


Index Terms

Computer Science

Control Systems

Keywords

DC/DC Converter  PSO-PID  Pulse width modulation  solar energy.