

Contribution to the Analytical Study of the Stability of a DC-DC Converter (Boost) Used for MPPT Control

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Abstract : This work is devoted to the modeling of DC-DC converter (boost) used for MPPT applications to set conditions of stability. For this, we establish a linear mathematical model of the DC-DC converter with an average small signal model. This model has allowed us to apply conventional linear methods of automation. A mathematical relationship between the duty cycle and the voltage of the panel has been set up. With this relationship we specify the conditions of the stability in closed-loop depending on the system parameters (the elements of storage capacity and inductance, PWM control).

Keywords : MPPT, PWM, stability, criterion of Routh, average small signal model

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