

SLIDING MODE AS AN EFFECTIVE TOOL TO CONTROL POWER ELECTRONIC NONLINEAR PLANTS

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The lecture presents the theory and application of sliding mode control in power electronics. It demonstrates the methodology of control design and the original algorithms of control and observation for various types of power electronic plants. Using such control, the system has very good dynamics characteristics and is robust against the load disturbance and the system parameters changing. The sliding mode approach is natural for the power electronics because, thanks to high-frequency power switches, e.g. MOSFET, IGBT and so on, modern power electronic plants are variable structure systems. In such systems the sliding movement could be by using the relay close-loop control and fulfilling special conditions. The sliding mode control allows full utilizing of potential of power converters and other power electronics. The lecture examines in detail different features of various types of converters and motors, three-phase voltage supply with regard to sliding mode control design.