

Development of a mathematical model of a vector control device based on the DFSMC for the study of electromechanical transients.

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Currently, for the purposes of effective management, planning and development of the electric power system, it has become necessary to create its unified mathematical model with mutual synchronization with the real power system in real time – a digital twin. In conditions of limited network capacity, a vector control device for mode parameters based on DFSMC can be used as an event to increase its throughput capacity, which will reduce the flow of power through an overloaded power grid element and load poorly loaded power lines.

The article develops a mathematical model of an electric power system with the proposed device for vector control of mode parameters, taking into account both electromechanical and electromagnetic transients, which allows creating a digital twin of an electric power system.

Key words: Double-Fed Synchronous Machines Complex (DFSMC), desynchronized synchronous machine, transfer capacity increase, mathematical model, transition process.