

Reaching phase free adaptive fuzzy synergetic power system stabilizer

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Description

In this paper, an adaptive fuzzy power system stabilizer is developed based on robust synergetic control theory and terminal attractor techniques. The main contribution consists in making the dynamic system insensitive to parameters variation. This aim is achieved using a new synergetic controller design such that power system states start, evolve and remain on a designer chosen attractor toward the equilibrium point therefore avoiding transient mode. Rendering the design more robust, fuzzy logic systems are used to approximate the unknown power system dynamic functions without calling upon usual model linearization and simplifications. Based on an indirect adaptive scheme and Lyapunov theory, adaptation laws are developed to make the controller handle parameters variations due to the different operating conditions occurring on the power system and to guarantee stability. The performance of the ...