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عنوان مقاله:

Investigation of ۲DOF FOPI controller for synchronous generator voltage stability

محل انتشار:

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خلاصه مقاله:

Voltage instability is one of the basic problems in power systems that have always been considered. This instability occurs when a disturbance, increased usage, or change in system condition causes a progressive and uncontrollable drop in voltage. In order to achieve voltage stability, tools such as s In the generator, one of the reliable methods is to use the automatic voltage regulator (AVR) system. In fact, each AVR needs to maintain the reactive power of the synchronous generator at the demand level, stable voltage and frequency of the power sources. hunt capacitors and power electronic equipment, etc., were introduced. In this research, the effectiveness of the control scheme based on proportional-integral fractional order (FOPI) controller for automatic voltage regulation (AVR) system is presented. In this study, a ۲DOF FOPI controller is proposed that deviates from the standard integer order to show the superiority of the additional degrees of freedom in the network and controller structure. To improve the performance of AVR, an particle swarm optimization algorithm (PSO) is proposed to adjust the parameters. This method achieves significant robustness to system parameter perturbations and perturbation discontinuities. In the staircase response analysis, it is observed that the settling time and overshoot of the system can be reduced compared to the recently published designs. Various analyzes have shown that the proposed controller is superior to the PI controller in terms of .robustness

کلمات کلیدی:

stability, voltage regulation, Synchronous generator, fractional order controller

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