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Suitable Tuning Method Selection for PID Controller Used in Digital Excitation System of Brushless Synchronous Generator

Authors : Deepak M. Sajnekar, S. B. Deshpande, R. M. Mohril

Abstract : At present many rotary excitation control system are using analog type of Automatic Voltage Regulator which now started to replace with the digital automatic voltage regulator which is provided with PID controller and tuning of PID controller is a challenging task. The cases where digital excitation control system is used tuning of PID controller are still carried out by pole placement method. Tuning of PID controller used for static excitation control system is not challenging because it does not involve exciter time constant. This paper discusses two methods of tuning PID controller i.e. Pole placement method and pole zero cancellation method. GUI prepared for both the methods on the platform of MATLAB. Using this GUI, performance results and time required for tuning for both the methods are compared. Sensitivity of the methods is also presented with parameter variation like loop gain 'K' and exciter time constant 'te'.

Keywords : digital excitation system, automatic voltage regulator, pole placement method, pole zero cancellation method
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