# An Efficient Design of Static Synchronous Series Compensator Based Fractional Order PID Controller Using Invasive Weed Optimization Algorithm

**Authors :** Abdelghani Choucha, Lakhdar Chaib, Salem Arif

**Abstract :** This paper treated the problem of power system stability with the aid of Static Synchronous Series Compensator (SSSC) installed in the transmission line of single machine infinite bus (SMIB) power system. A fractional order PID (FOPID) controller has been applied as a robust controller for optimal SSSC design to control the power system characteristics. Additionally, the SSSC based FOPID parameters are smoothly tuned using Invasive Weed Optimization algorithm (IWO). To verify the strength of the proposed controller, SSSC based FOPID controller is validated in a wide range of operating condition and compared with the conventional scheme SSSC-POD controller. The main purpose of the proposed process is greatly enhanced the dynamic states of the tested system. Simulation results clearly prove the superiority and performance of the proposed controller design.