

# **Modern Nonlinear Theory as Applied to SSR of the IEEE Second Benchmark Model**

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## **Abstract**

The modern nonlinear theory is applied on the first system of the IEEE second benchmark model to investigate a new phenomenon in power system. This phenomenon of turbine-generator electromechanical interaction with series capacitor has historically been known as "subsynchronous resonance", (SSR). The bifurcation theory is used to study the stability of the power system. We show the effect of d- and q-axes damper windings on SSR in power system.