Abstract

This paper investigates a method for the state estimation of nonlinear systems described by a class of differential-algebraic equation (DAE) models using the extended Kalman filter. The method involves the use of a transformation from a DAE to ordinary differential equation (ODE). A relevant dynamic power systems model using decoupled techniques will be proposed. The estimation technique consists of a state estimator based on the EKF technique as well as local stability analysis. High performances are illustrated through a real time application on 5 buses test system with DSP device (Dspace DS1104).

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**Index Terms**

Computer Science\hspace{3cm} Power Systems

**Keywords**

Power system dynamics \hspace{1cm} Extended Kalman Filter \hspace{1cm} convergence analysis \hspace{1cm} Time computing