

A Robust Distributed State Estimation of AC/DC system with LCC-HVDC Tie Line

Haibo Zhang¹, Houyv Qi¹, and Shuai Wang¹

¹North China Electric Power University

January 24, 2023

Abstract

A robust distributed state estimation algorithm for AC/DC system with AC tie lines and high voltage direct current (LCC-HVDC) tie line is proposed. The proposed algorithm consists of the robust distributed AC state estimation and the robust DC state estimation in the coordinator. For AC state estimation, a distributed state estimation algorithm based on the bilinear algorithm is designed, which can not only achieve the same accuracy as the centralized algorithm, but also simplify the nonlinear iterative process of the exponential objective function robust algorithm and reduce the operation scale. For DC state estimation, the objective function adopts the maximum absolute value of exponential to make it better convergent. Finally, the correctness and effectiveness of the algorithm are verified by the simulation of three IEEE 118 bus interconnected systems.

Hosted file

Robust_Distributed_State_Estimation.docx available at <https://authorea.com/users/579154/articles/620763-a-robust-distributed-state-estimation-of-ac-dc-system-with-lcc-hvdc-tie-line>