Super-Positioning of Voltage Sources for Fast Assessment of Wide-Area Thévenin Equivalents

Møller, Jakob Glarbo; Jóhannsson, Hjörtur; Østergaard, Jacob

Published in:
Proceedings of the 2018 IEEE PES General Meeting

Link to article, DOI:
10.1109/PESGM.2018.8585962

Publication date:
2018

Document Version
Peer reviewed version

Citation (APA):
Super-Positioning of Voltage Sources for Fast Assessment of Wide-Area Thévenin Equivalents
Jakob Møller¹, Hjörtur Jóhannsson¹, Jacob Østergaard¹
¹Elektro, Technical University of Denmark
A method for superimposing voltage sources is sought optimized by using a sparse triangular solver and multiprocessing. A revision to the method is suggested which exploits Schur’s complement of the network admittance matrix and optimal re-use of computations. The algorithm is implemented and parallelized for shared memory multiprocessing. The proposed algorithm is tested on a collection of large test systems and performance is found to be significantly better than the reference method. The algorithm will thereby facilitate a speed-up of methods relying on Thévenin equivalent representation such as the Thévenin equivalent method for contingency assessment.