Downloaded from orbit.dtu.dk on: Jul 21, 2024

DTU Library

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

Link back to DTU Orbit

Citation (APA):
Møller, J. G., Jóhannsson, H., & Østergaard, J. (2018). Super-Positioning of Voltage Sources for Fast Assessment of Wide-Area Thévenin Equivalents. In *Proceedings of the 2018 IEEE PES General Meeting* IEEE. https://doi.org/10.1109/PESGM.2018.8585962

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

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

Jakob Møller[1], Hjörtur Jóhannsson[1], Jacob Østergaard[1]
[1]Elektro, 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.

978-1-5386-7703-2/18/$31.00 ©2018 IEEE