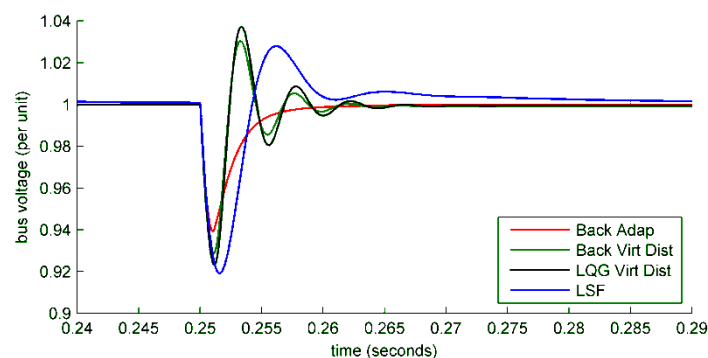


Bachelor-/ Master-Thesis

Controller Optimization and Performance Comparison in MVDC Systems

Context:

In MVDC distribution system the bus voltage is supplied by converters. To maintain bus voltage stability control algorithms in these converters are used. A comparison between different control algorithms: Centralized vs. Decentralized or Linear vs. Nonlinear is difficult as one can choose parameters that make one algorithm relatively better or worse but this choice does not imply an overall optimal performance. Parameter tuning by engineering knowledge will not lead to optimal performance especially in nonlinear systems with many controllable units.



Materials provided to the student are:

- MVDC Shipboard Power System/Microgrid
- Decentralized and Centralized control algorithms in Matlab
- Linear and Nonlinear control algorithms in Matlab

Tasks for a Thesis depending on interest can be:

- Implementation of new Control Algorithms in Matlab
- Defining objective functions (e.g. weighted overshoot + transient time or squared error)
- Implementation of an optimization technique (Particle Swarm Optimization, Genetic Algorithm or Simplex) for tuning the parameters based on an objective function.

The student will receive an introduction in order to start quickly with the required tools. During the work the student will be supervised and advised by the research associates of the Institute.

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