In order to conduct power system simulations with high shares of wind energy, standard wind turbine models, which are aimed to be generic rms models for a wide range of wind turbine types, have been developed. As a common practice of rms simulations, the power electronic interface of wind turbines is assumed to be ideally synchronized, i.e. grid synchronization (e.g. PLL) is not included in simplified wind turbine models. As will be shown in this paper, this practice causes simulation convergence problems during severe voltage dips and when the loss of synchronism occurs. In order to provide the simulation convergence without adding complexity to the generic models, a first order filtering approach is proposed as a phase angle calculation algorithm in the grid synchronization of the rms type 4 wind turbine models. The proposed approach provides robustness for the simulation of large scale power systems with high shares of wind energy.
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