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Simulink Library for Reference Current Generation in Active DC Traction Substations

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Abstract : This paper is focused on the reference current calculation in the compensation mode of the active DC traction substations. The so-called p-q theory of the instantaneous reactive power is used as theoretical foundation. The compensation goal of total compensation is taken into consideration for the operation under both sinusoidal and nonsinusoidal voltage conditions, through the two objectives of unity power factor and perfect harmonic cancelation. Four blocks of reference current generation implement the conceived algorithms and they are included in a specific Simulink library, which is useful in a DSP dSPACE-based platform working under Matlab/Simulink. The simulation results validate the correctness of the implementation and fulfillment of the compensation tasks.

Keywords : active power filter, DC traction, p-q theory, Simulink library
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