

ABSTRACT OF THE DOCTORAL DISSERTATION

in the field of Engineering and Technology
in the discipline of Automation, Electronics, Electrical Engineering and Space Technologies

Reduction of Supply Current Ripple in a Switched Reluctance Machine

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The dissertation presents an original algorithm and accompanying functions designed to synchronise the active source-current filter with a switched reluctance drive. The proposed solution maintains the filter at an operating point that ensures the highest possible efficiency for a given drive condition and remains effective at low rotational speeds. This has been confirmed through experimental studies, which substantiate the validity of the thesis. The solution is universal and can be implemented in drives equipped with any switched reluctance machine to reduce the RMS value of the source current. The dissertation also introduces a universal coefficient for rapid assessment of the quality of current flowing through a DC source, a coefficient for evaluating the performance of the active filter, and coefficients for analysing higher harmonics in the supply current and in the supply voltage of the switched reluctance machine.