

Combination of Luenberger Observer and PI Controller for Rotor Flux Linkage Estimation, by using Induction Motor Saturation Model

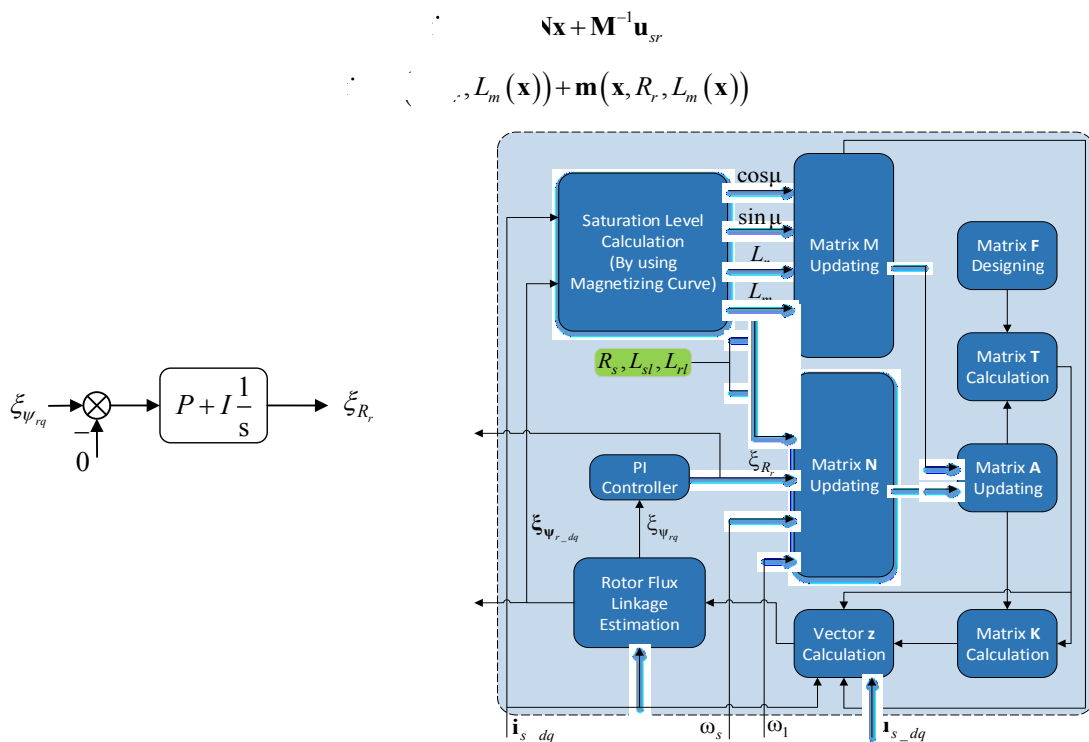
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Abstract - This paper presents a novel online method for observing induction motor rotor flux linkage and rotor resistance, by the combination of PI controller and Luenberger Observer, which is built totally based on induction motor saturation model. Resistance uncertainty is also being considered. Theoretical derivations are given in detail, step by step; also the system stability problem when using induction motor saturation model to build up the Luenberger Observer is revealed. The simulation and experimental results show the system has good dynamic and steady-state performance, which validates the proposed method. The step change of the rotor resistance can still be very well estimated, and torque fluctuation can be well suppressed. Factors which may influence the estimation accuracy are discussed.

Keywords— *induction motors, observers, parameter estimation, state estimation, vector control.*



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