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Scalar Modulation Technique for Six-Phase Matrix Converter Fed Series-Connected Two-Motor Drives

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Abstract : In this paper we treat a new structure of a high-power actuator which is used to either industry or electric traction. Indeed, the actuator is constituted by two induction motors, the first is a six-phase motor connected in series with another three-phase motor via the stators. The whole is supplied by a single static converter. Our contribution in this paper is the optimization of the system supply source. This is feeding the multimotor group by a direct converter frequency without using the DC-link capacitor. The modelling of the components of multimotor system is presented first. Only the first component of stator currents is used to produce the torque/flux of the first machine in the group. The second component of stator currents is considered as additional degrees of freedom and which can be used for power conversion for the other connected motors. The decoupling of each motor from the group is obtained using the direct vector control scheme. Simulation results demonstrate the effectiveness of the proposed structure.

Keywords : induction machine, motor drives, scalar modulation technique, three-to-six phase matrix converter
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