

## **Advanced Digital Control of a Six-Phase Series-Connected Two-Induction Machine Drive**

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### **Abstract :**

This paper deals with a decoupled vector control of two induction motors connected in series using mainly RST controller. This kind of controller offers further degrees of freedom to set the dynamic of the system. The first step is to fixe a reference model of the current and speed loops. A method of pole placement is detailed. Then, the three polynomial elements R, S, T of each controller will be synthesized by utilizing algebraic approaches and by solving the Diophante equation. In a first time, performance of RST controller is proven by simulation and experiment on the current and speed controls. Nonetheless, it is also possible to obtain better tracking, disturbance rejection and settling time by combining RST and IP controllers in practice. A special case is therefore treated where RST regulator is used for currents and IP controller is considered for speeds. This case will be experimentally demonstrated.

**Keywords :** DIGITAL control systems; ELECTRIC machinery, Induction; ELECTRIC controllers; SURFACE discharges (Electricity); ELECTRIC current regulators; SIMULATION methods & models.

Journal title / Revue : INTERNATIONAL REVIEW OF ELECTRICAL ENGINEERING-IREE, ISSN : 1827-6660, Issue : 4, Volume : 6, pp. 1607 – 1619, JUILLET 2011.