

MEP 1522/3 Electric drives

Assignment 3

In constant V/Hz control technique it is assumed that the stator resistance and leakage inductance drops are negligible, especially at high speed and small load. In other words, the back emf is comparatively large at high speed and hence these voltage drops can be neglected. By maintaining constant V/f, constant E_g/f and hence constant air-gap flux is assumed. This assumption is however invalid at low speeds since a significant voltage drop appear across the stator impedance; terminal voltage, V no longer approximates E_g

Simulate an open loop constant V/Hz control scheme using the Simulink model which can be downloaded from the course website. With a constant load torque, show that the performance of the induction motor at low speed can be improved by boosting the right amount of voltage.

Use the default machines parameters and settings (3-phase, 415V, $\omega_{\text{rated}} = 152 \text{ rad/s}$ $T_{\text{rated}} = 150 \text{ Nm}$).

Write your report using an IEEE paper format, i.e. containing abstract, introduction background, results, references, etc., in two-column format. The paper should not be more than 6 pages. Clearly present your design procedures and state any assumption.