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Basics of induction Motors

Starting current of an induction motor

Why does the induction motor take high starting current?
Because of the inertia of the rotor!!
Well, that's not exactly correct…

The starting current of an induction motor is a phenomenon due to the interaction between the stator and rotor magnetic fields. Usually the starting current of an induction motor is between 6-7 times the rated full load current of the motor. When 3 phase voltages applied across the stator winding for starting of induction motor, rmf is developed in the stator winding.

And this rmf of the stator will induce emf in the rotor as per faraday's laws of electromagnetic induction. As the rotor is short circuited a current flow in the rotor winding. This current is proportional to the rate of change of flux linkage. At the time of starting the rate of change of flux linkage is maximum the current flowing in the rotor winding is also maximum. According to the right-hand thumb rule the rotor also develops a magnetic field which is rotating in nature.

This two magnetic field of stator and rotor will react with each other in such a way that they will oppose each other according to the Lenz's law now, the original stator magnetic field is disturbed as a result this phenomenon will draw a heavy inrush current to stator winding as long as the flux linkage has some value.