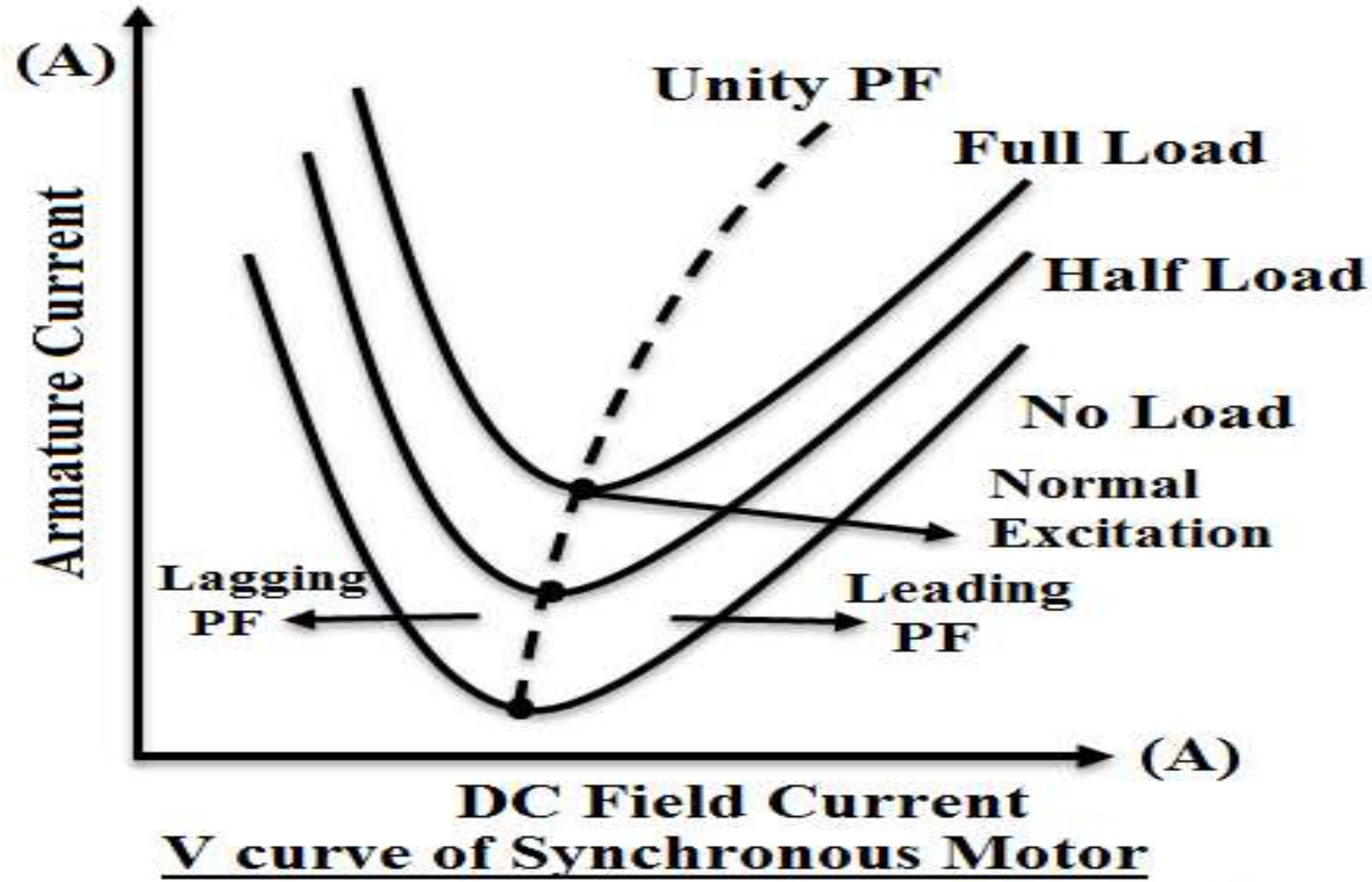
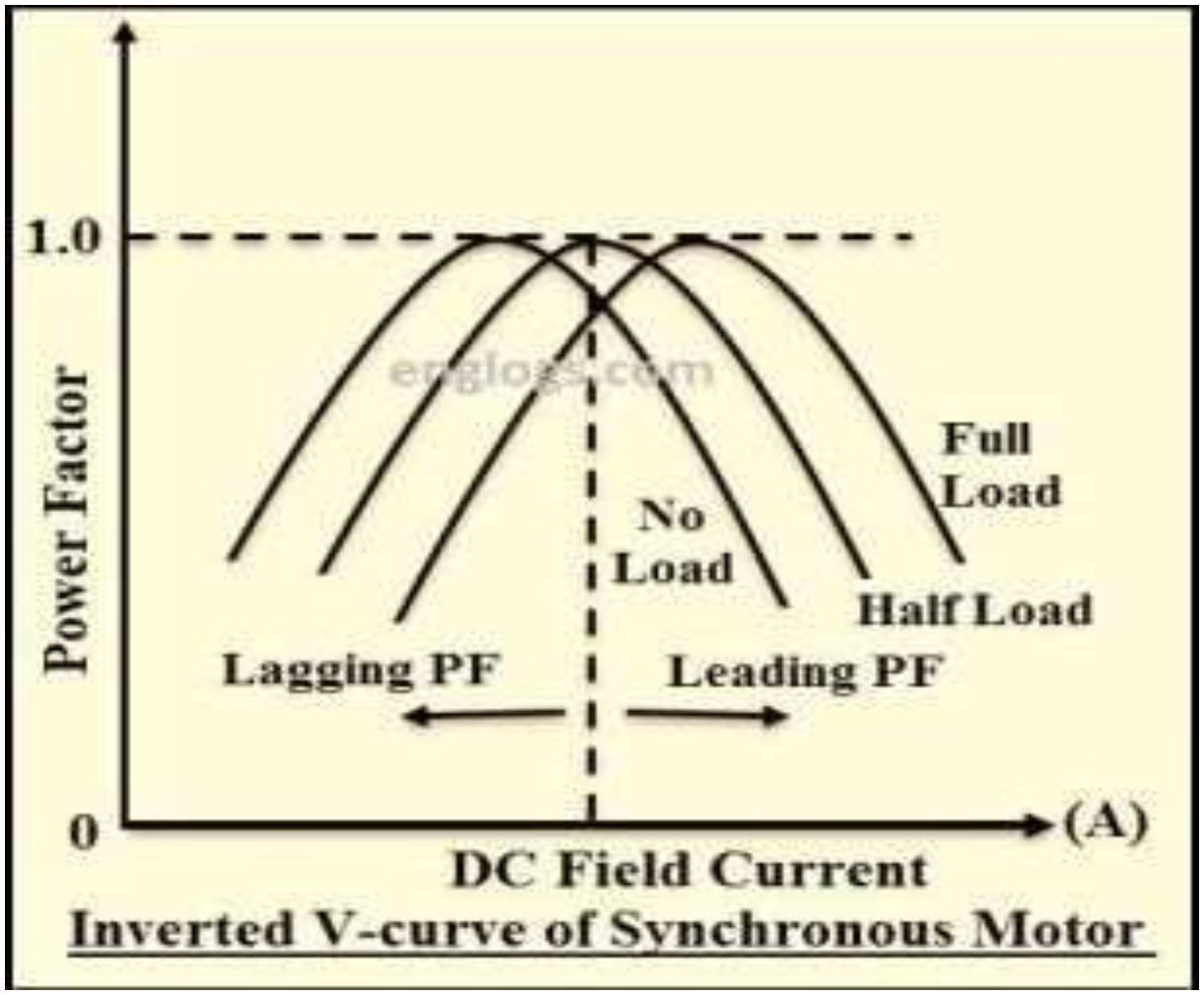
V- curve


(A)
Armature Current
Unity PF
Full Load
Half Load
No Load
Normal
Excitation
Lagging
PF
Leading
PF
(A)
DC Field Current
V curve of Synchronous Motor
Electrical Deck

V- curve:

- V curve is a plot of the stator current versus field current for different constant loads.
- The Graph plotted between the armature current Ia and field current If at no load the curve is obtained known as V Curve.
- Since the shape of these curves is similar to the letter “V”, thus they are called the V curve of a synchronous motor.

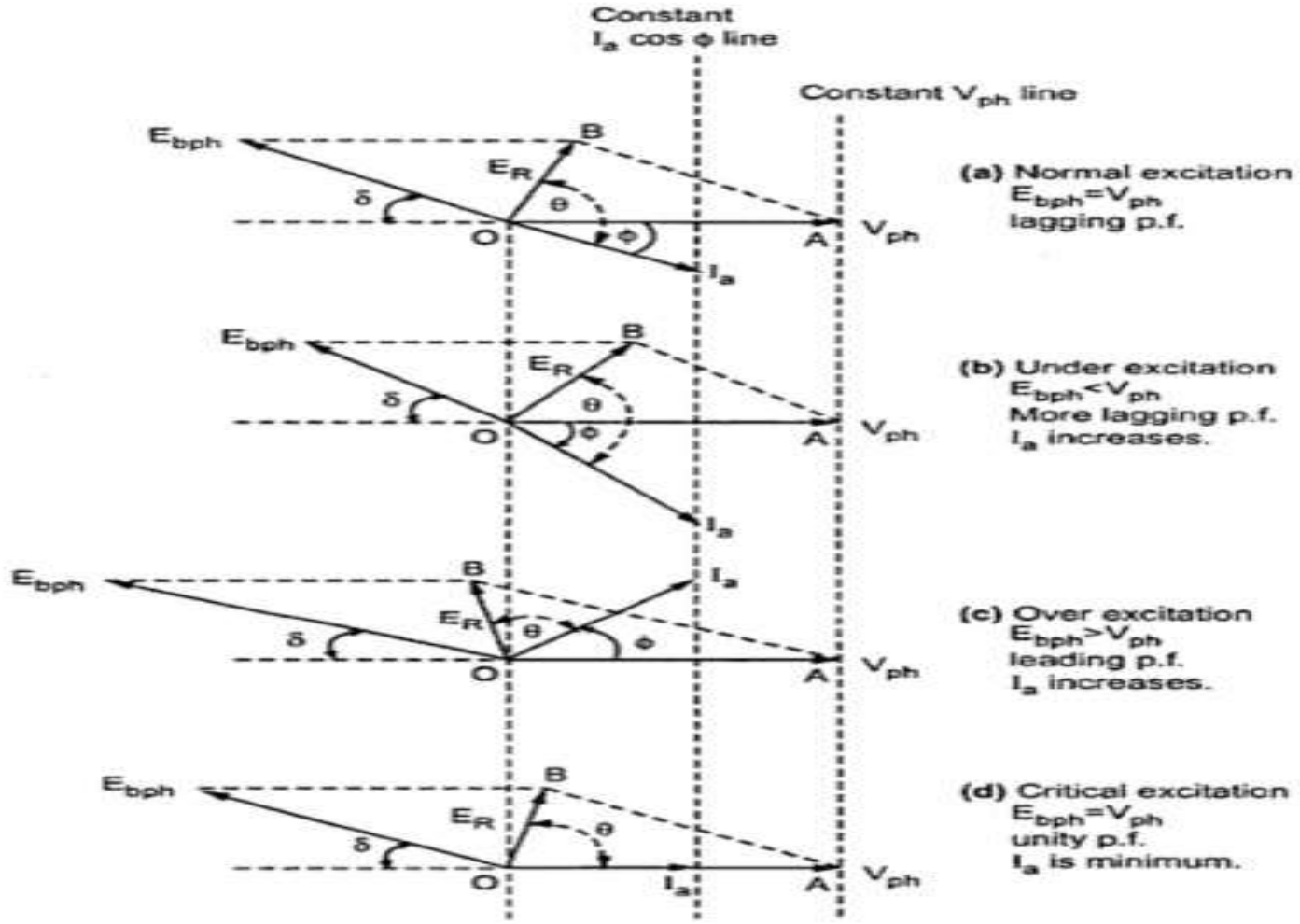
Inverted V curve



Inverted V curve

- Inverted V curves of a synchronous motor are defined as the graphs plotted between power factor (cosø) and field current (I_f) of the motor.
- The inverted V-Curves of synchronous motor shows how the power factor varies with excitation.
- From inverted V-curves, it is observed that the power factor is lagging when the motor is under excited
- and leading when it is over-excited.
- In between, normal/critical excitation the power factor is unity.

Effect of change in excitation: The change in DC excitation of a synchronous motor will also change the power factor.



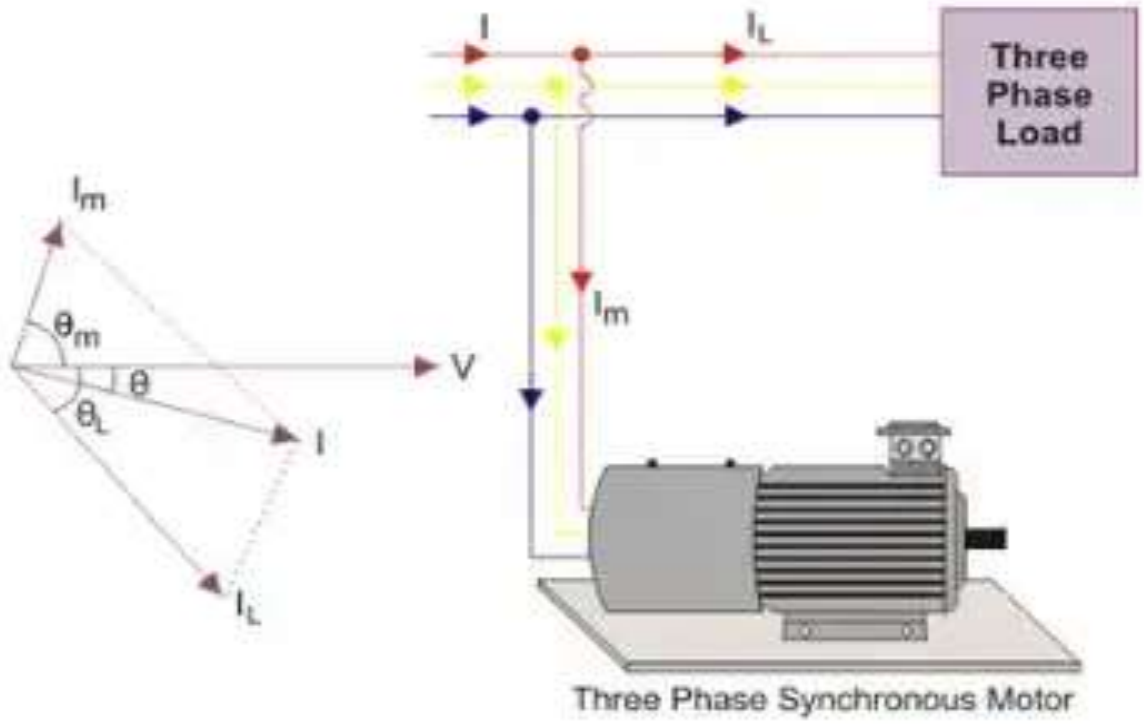
Effect of change in excitation:

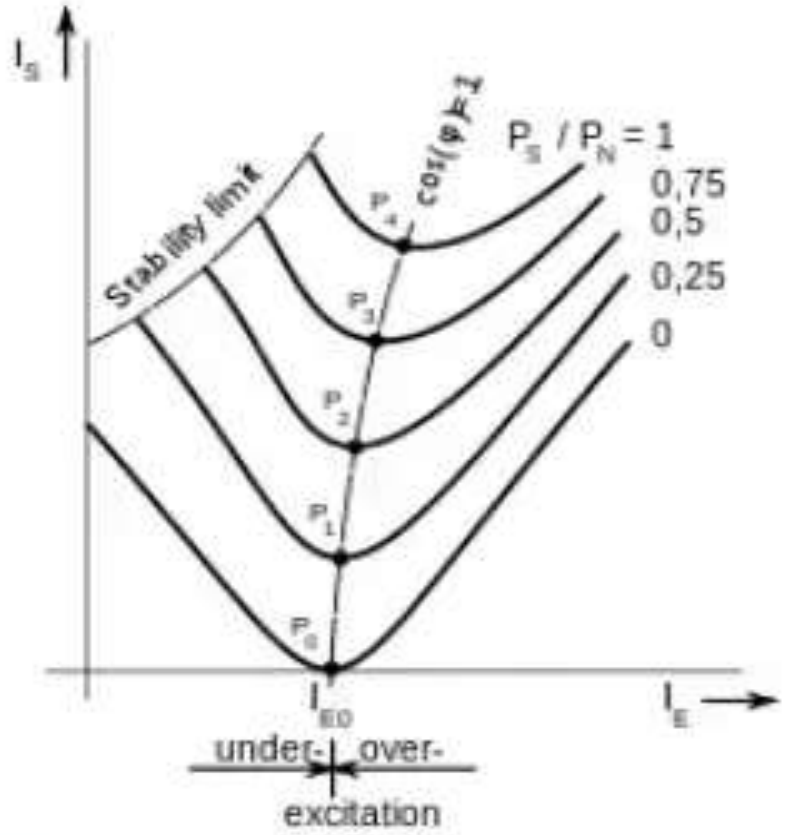
The change in DC excitation of a synchronous motor will also change the power factor.

If excitation of a synchronous motor running with a constant load is decreased from its normal value, it leads to an increase in both armature current and power factor angle.

If excitation of a synchronous motor running with a constant load is increased from its normal value, it decreases in both armature current and power factor angle.

What is Synchronous Condenser?





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