



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)



COIMBATORE-35

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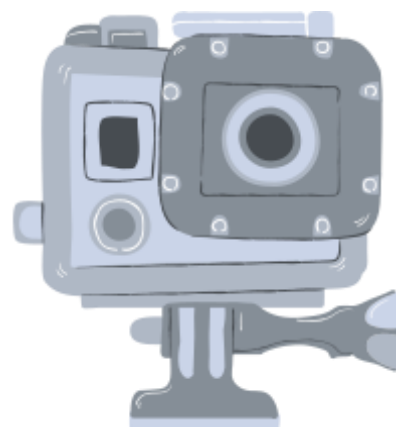
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE NAME: 19EET207/ SYNCHRONOUS AND INDUCTION
MACHINES**

II YEAR / IV SEMESTER

Unit 5 – SPECIAL MACHINES

Topic 7: Switched Reluctance Motor



25.3.2023

19EET207/SIM/Dr.C.Ramakrishnan/ ASP/EEE

01/10



GUESS THE TOPIC NAME...

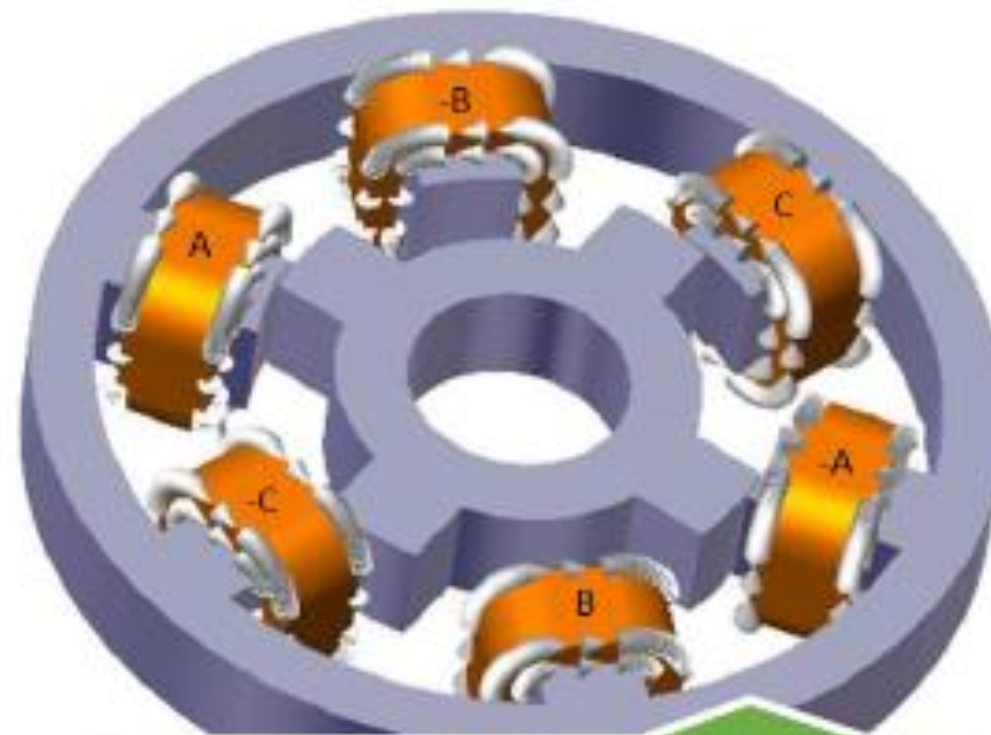




Construction



It's a doubly-salient, singly-excited, independent stator excited motor



Stator windings on diametrically opposite poles are connected in series or parallel to form one phase

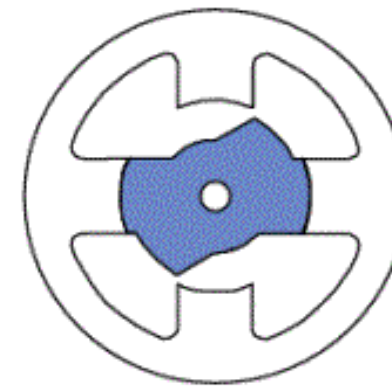


The stator is same as PM motor but the rotor is simpler having no permanent magnet

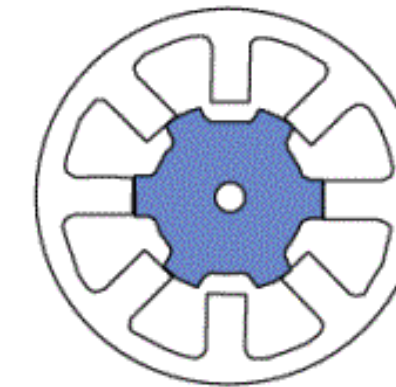


SRM motor

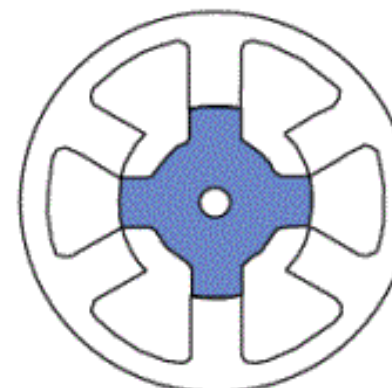
- $6/4, 8/4, 10/6, 12/6, 4/2, 2/2$ etc configurations are possible, but $6/4$ & $8/4$ are most common
- Higher the no. of stator/rotor pole combination, higher the no. of phase which aide to torque ripple reduction



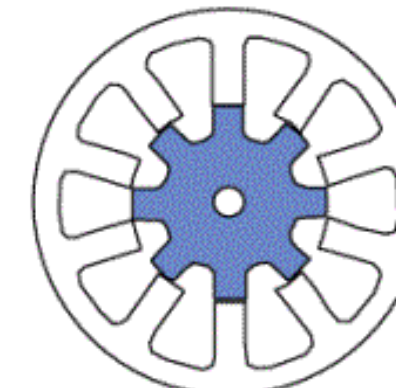
2-phase,
4 rotor poles/2 stator poles
(a)



4-phase,
8 rotor poles/6 stator poles
(b)



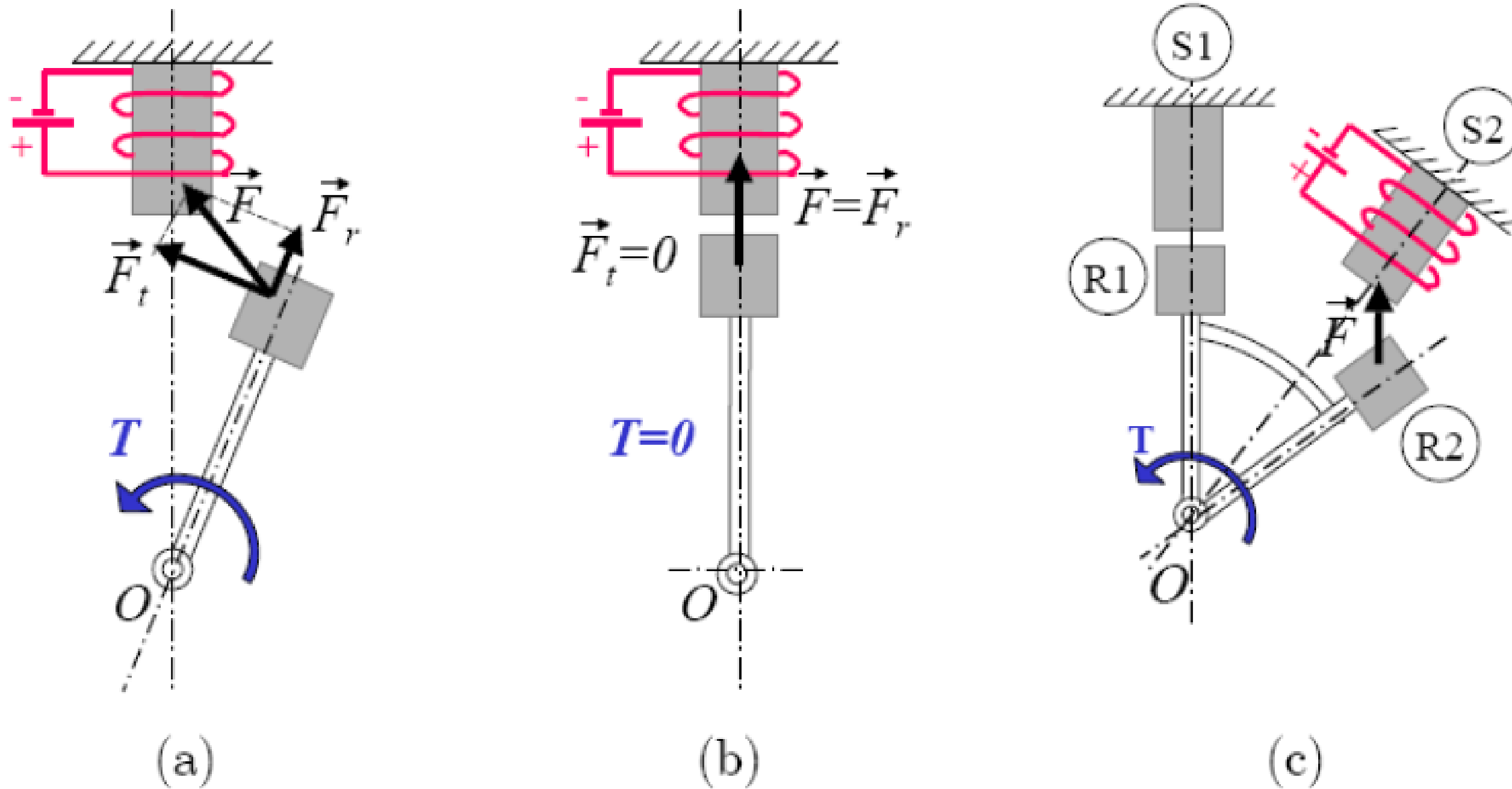
3-phase,
6 rotor poles/4 stator poles
(c)



5-phase,
10 rotor poles/8 stator poles
(d)



Principle of Operation



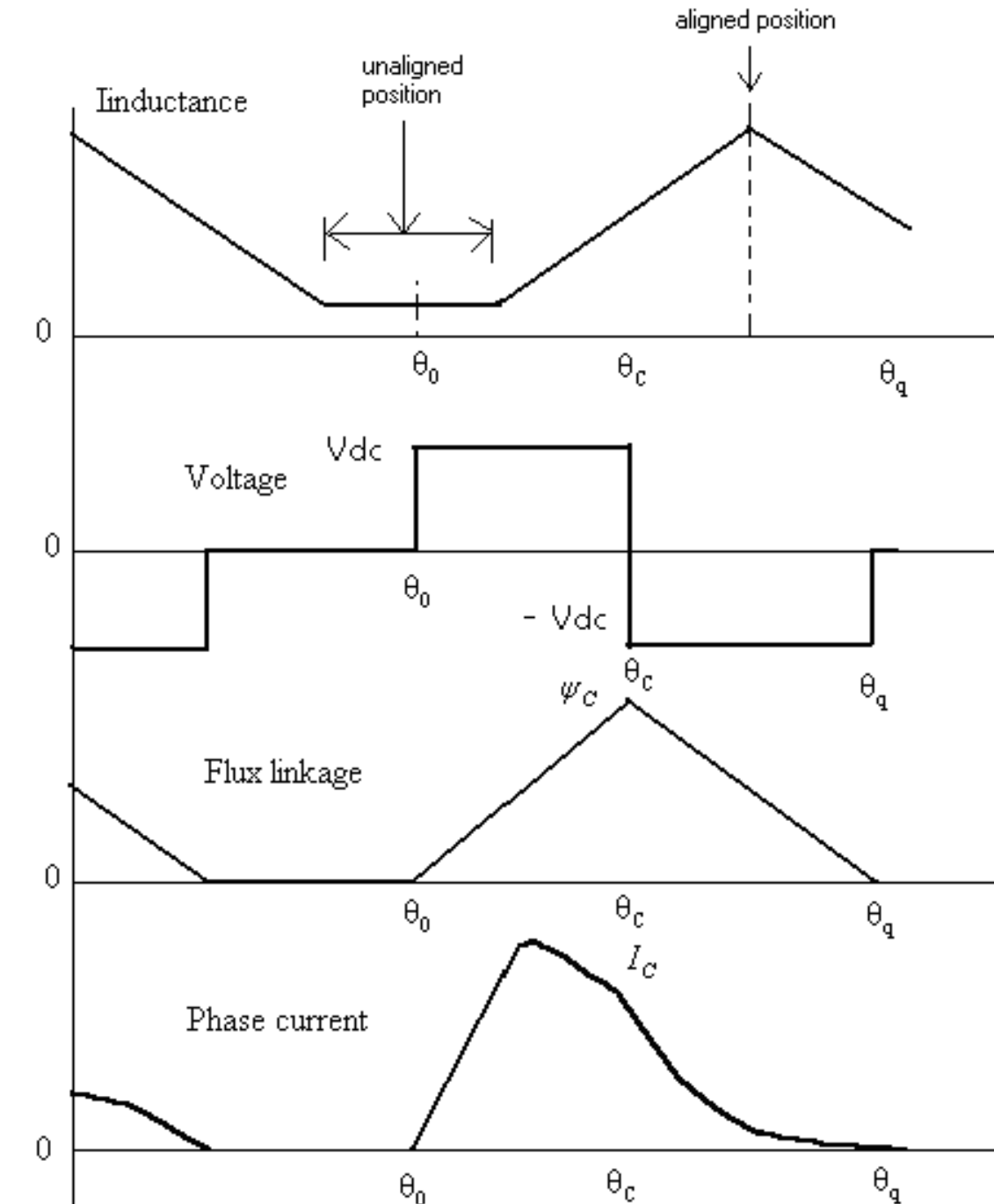
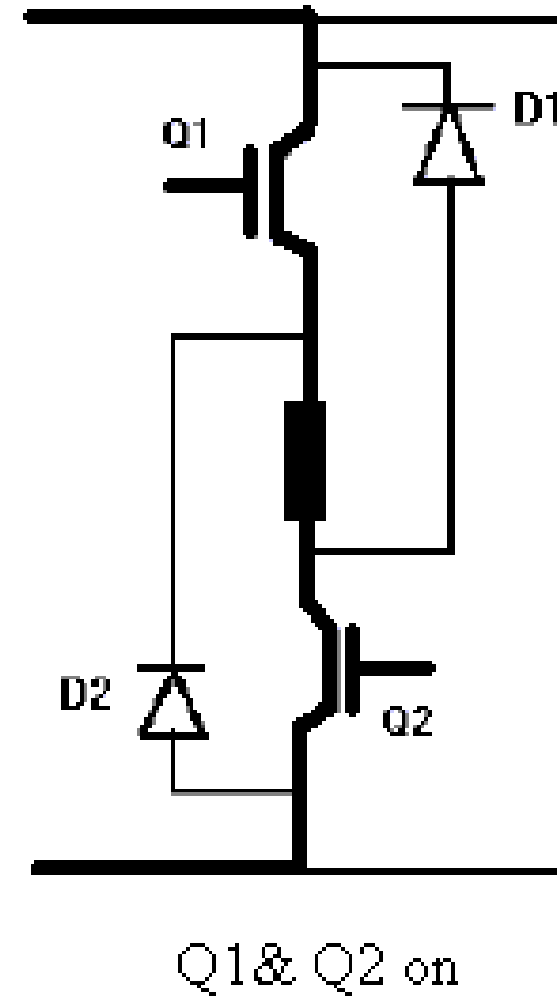
- Inductance of stator phase winding varies with rotor position
- Torque is produced only during variation of inductance
- Current is made available only during this variation, hence the need for rotor position feedback sensor



Principle of operation

Voltage Source control

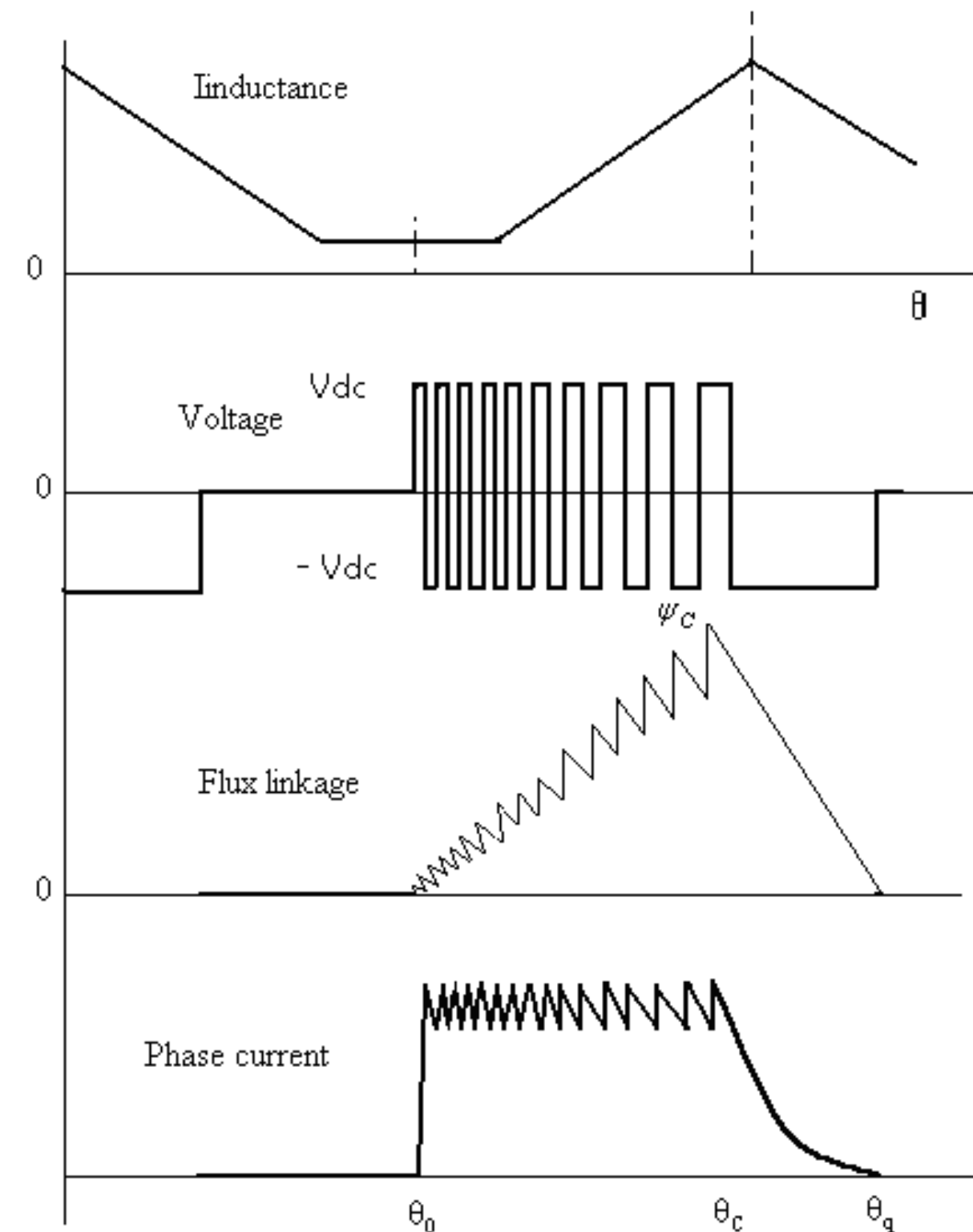
- Both transistors are switched on at θ_0 and both are switched off at θ_c
- Conducts through D2 and D1 when negative voltage is applied between θ_c and θ_q





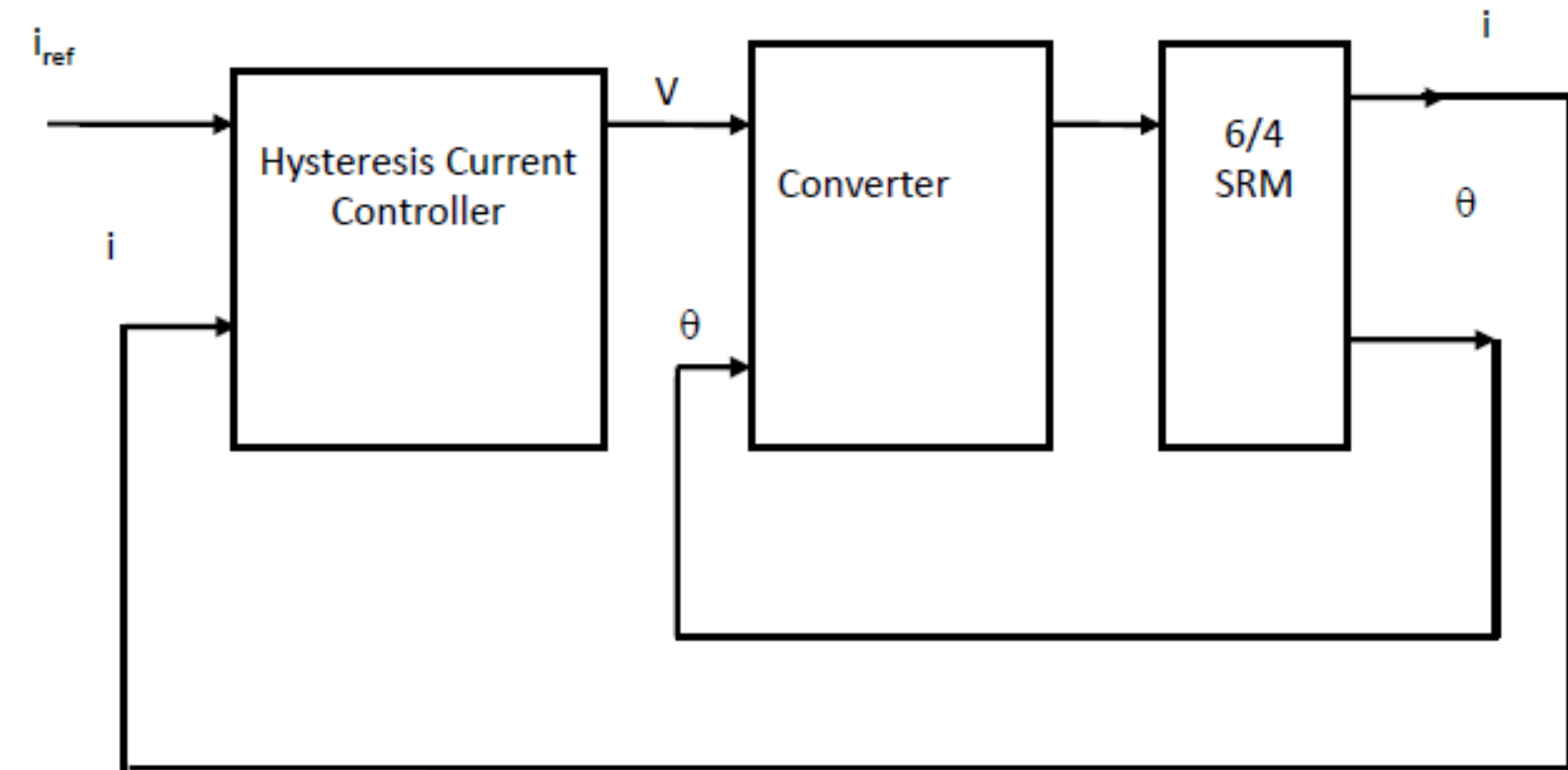
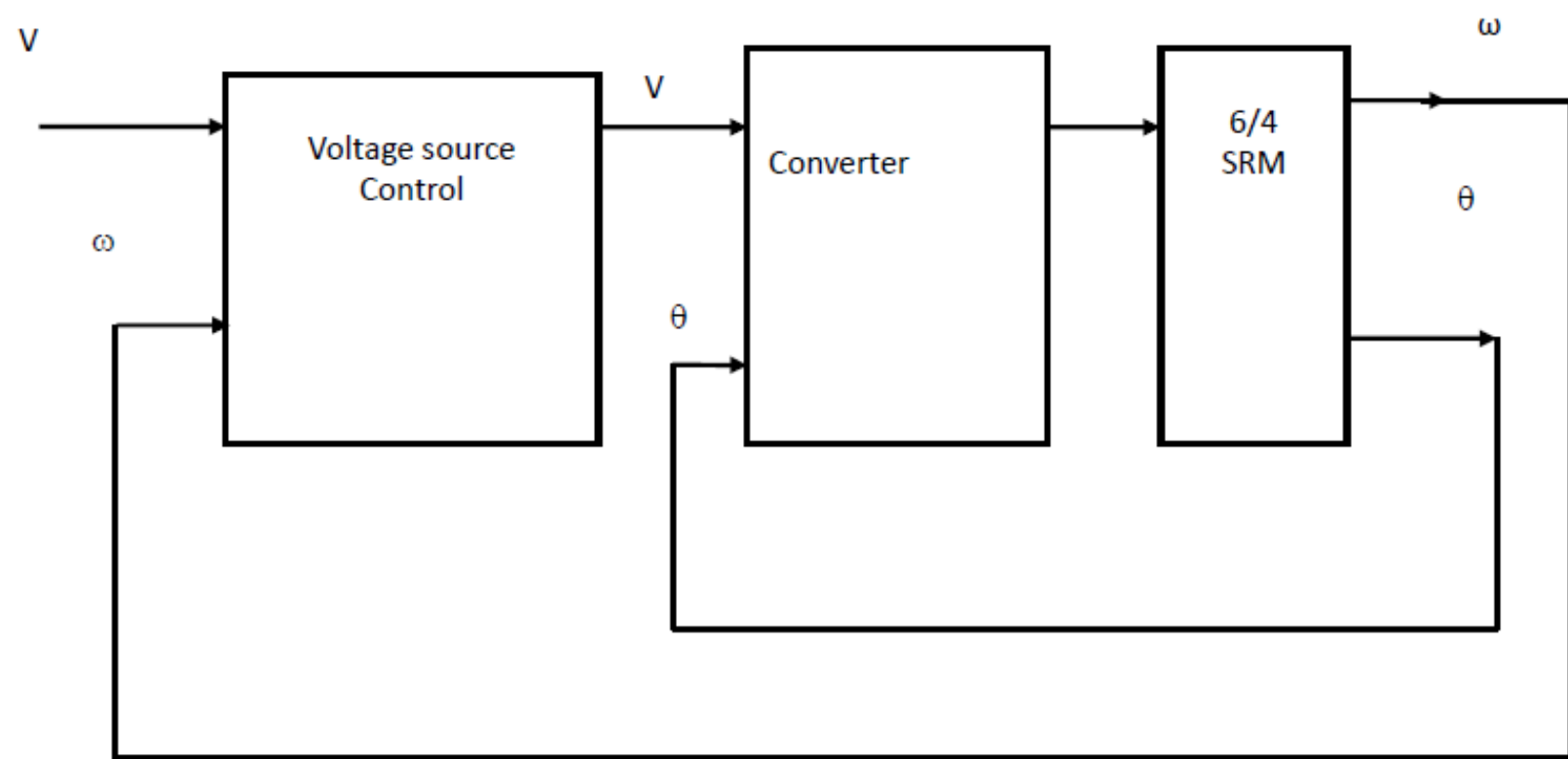
Hysteresis current control

- Power switches are switched off or on according to the current is greater than or less than a reference current.
- The instantaneous phase current is measured and feedback to summing junction.
- The error is used directly to control the states of power transistors.





SRM controller





SUMMARY



- SWITCH RELUCTANCE MOTOR



KEEP
LEARNING..
Thank u

SEE YOU IN NEXT CLASS