

ECE 404-TD / 504-TD

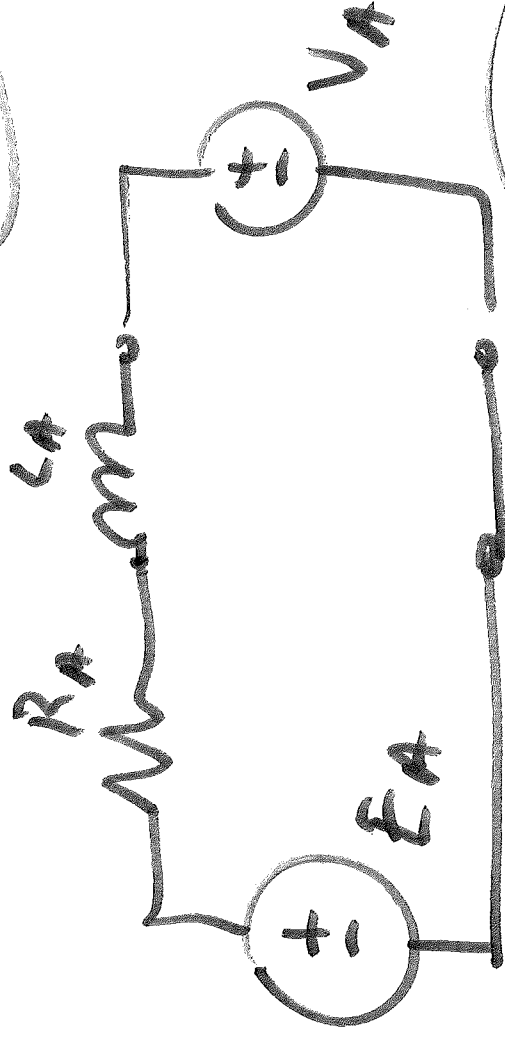
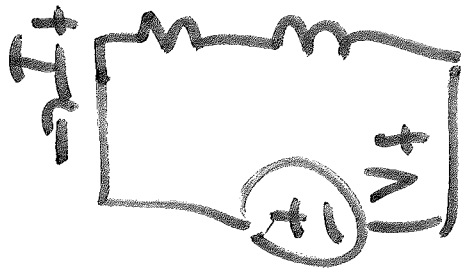
ST: T&D APPLICATIONS OF
VOLTAGE SOURCE CONVERTERS

SESSION no. 1

1) ARMATURES VOCTA48

$\phi = k\phi_a I_a$

2) FIELD CURRENT

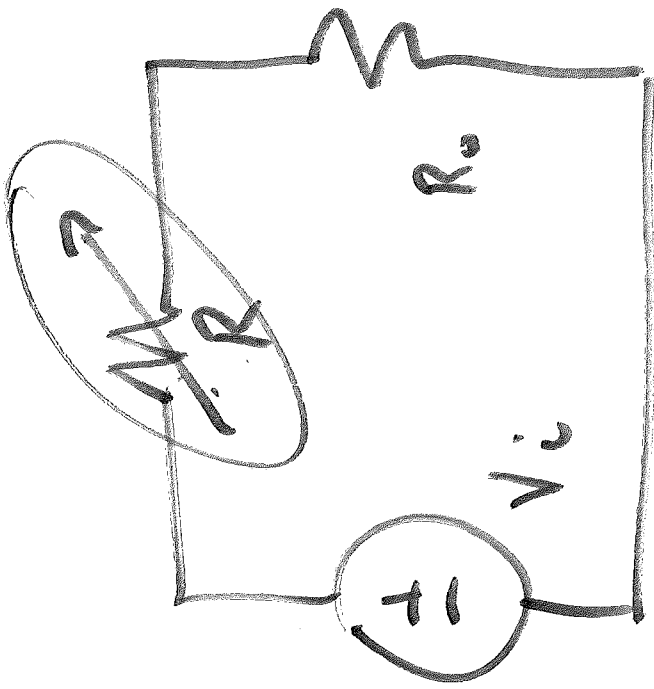


$V_a \approx E_a$

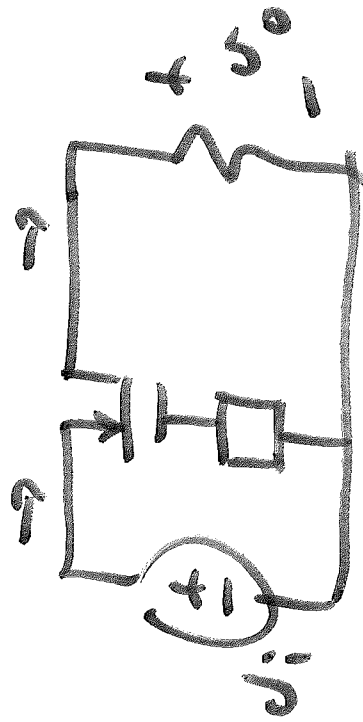
$E_a = k\phi_a \omega$

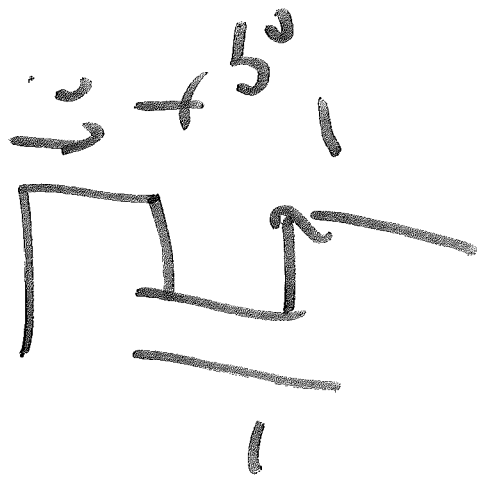
$\phi_a = \phi$

$(I_f) \phi = \phi_a$



$$\eta = \frac{v_o}{v_i}$$





OPER:

$i = 0$ $> j = 5$
 $5 \neq 0$ $= 0$

CLOSE

$i \neq 0$ $> j = 5$
 $5 = 0$ $= 0$

Five Basic Concepts of Power Electronics

1. Current through an inductor is continuous.
2. Voltage across a capacitor is continuous.
3. Voltage across an inductor integrates to zero over a complete cycle.
4. Current through a capacitor integrates to zero over a complete cycle.
5. Energy is ALWAYS conserved.

ECE 404 / 504

**T & D Applications of Voltage
Sourced Converters**

Lesson 1

AC waveform:

Amplitude

Frequency

Phase

<http://www.powerworld.com/>

GloverSarmaOverbye

Version 16

Goals:

- 1. Introduce power electronic circuits in switch mode**
- 2. Describe and analyze Voltage Sourced Converters: topologies, switching strategies, and control options**
- 3. Apply VSCs to wind turbines, photovoltaics,**

**HVDC, FACTS, generation,
and storage.**

**4. Model, simulate, and
design control for VSCs
under normal and
abnormal conditions.**