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Linear Circuit

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Overview:

- Kirchhoff's law
- 3 methods of solving circuits: ODE, phaser, impedance
- Advanced techniques for simplifying circuits

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1 Kirchhoff's Law

The two Kirchhoff's laws are the fundamentals to every circuit-solving problem.

- Kirchhoff's Current Law (KCL)
- Kirchhoff's Voltage Law (KVL)

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2 Methods of Solving Circuit

There are 3 different methods commonly found in textbooks:

- Solving ODEs
- Phasor Diagram
- Impedance method

Solving with ODEs is the most fundamental approach, but it is also the most annoying. So electronic engineers developed the latter two methods to simplify their jobs.

2.1 System of ODEs

2.1.1 R-C Circuit

2.1.2 R-L Circuit

2.1.3 R-C-L Circuit

2.2 Phasor Diagram

2.3 Equivalent Impedance

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3 Advanced Circuit Techniques

Here introduces several techniques for simplifying circuits that are used by electronic engineers very commonly, but are never taught to physics students (so it is easier to make you suffer).

3.1 Thevenin - Norton Equivalency

3.1.1 Linear Circuit Blackbox

3.1.2 The Equivalent Circuit

3.2 Superposition Theorem

3.3 Y-Δ Transform

— The End —