

CHAPTER OVERVIEW

7: Magnetostatics

Magnetostatics is the theory of the magnetic field in conditions in which its behavior is independent of electric fields, including

- The magnetic field associated with various spatial distributions of steady current
- The energy associated with the magnetic field
- Inductance, which is the ability of a structure to store energy in a magnetic field

The word ending “-statics” refers to the fact that these aspects of electromagnetic theory can be developed by assuming that the sources of the magnetic field are time-invariant; we might say that magnetostatics is the study of the magnetic field at DC. However, many aspects of magnetostatics are applicable at “AC” as well.

- 7.1: Comparison of Electrostatics and Magnetostatics
- 7.2: Gauss’ Law for Magnetic Fields - Integral Form
- 7.3: Gauss’ Law for Magnetism - Differential Form
- 7.4: Ampere’s Circuital Law (Magnetostatics) - Integral Form
- 7.5: Magnetic Field of an Infinitely-Long Straight Current-Bearing Wire
- 7.6: Magnetic Field Inside a Straight Coil
- 7.7: Magnetic Field of a Toroidal Coil
- 7.8: Magnetic Field of an Infinite Current Sheet
- 7.9: Ampere’s Law (Magnetostatics) - Differential Form
- 7.10: Boundary Conditions on the Magnetic Flux Density (B)
- 7.11: Boundary Conditions on the Magnetic Field Intensity (H)
- 7.12: Inductance
- 7.13: Inductance of a Straight Coil
- 7.14: Inductance of a Coaxial Structure
- 7.15: Magnetic Energy
- 7.16: Magnetic Materials

Contributors and Attributions

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