

Problem 1. Maxwell equations in the Gaussian unit system

According to the correspondence of physical quantities between the SI and Gaussian unit systems. Please translate the Maxwell equations in the SI unit system to the Gaussian unit system.

Problem 2. Gaussian units

Please figure out the dimensions of charge, electric current, electric potential, magnetic flux, resistance, charge capacitance, and inductance in the Gaussian unit systems.

Problem 3. Natural units

Physicists love the Gaussian units, hence, we use the Gaussian units in this problem. Please use the following quantities including electron electric charge e , electron mass m , Planck constant \hbar , and light velocity c to construct the following quantities.

- 1) A dimensionless quantity.
- 2) A natural length unit to describe the size of an atom.
- 3) A natural energy unit for an atomic transition.
- 4) A unit for electric conductance.
- 5) A unit for magnetic flux.
- 6) A unit for an inductance.