

Prep guide – Helmholtz theorem

Big picture goal – To be able to describe why the Maxwell equations are laid out how they are, and to come up with a recipe for expressing dynamic electromagnetic fields in terms of potentials.

1) Qualitatively, what is the content of the Helmholtz theorem?

2) How do we mathematically define \vec{E} and \vec{B} in terms of a scalar potential V and a vector potential \vec{A} ?

3) Why is it that we only need one kind of potential to define \vec{B} , but two kinds of potentials to define \vec{E} ?