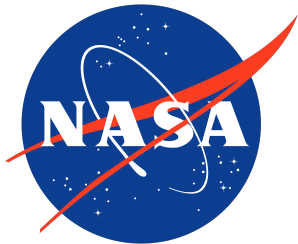


Lorentzian Geometry and Topological Electromagnetism

Colin Roberts

Thanks and funding



Section 1

Introduction

Outline

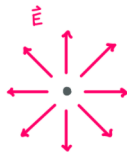
- 1 Intro Lorentzian geometry
- 2 Poincaré group $A(1, 3)$ and its Lie algebra $\mathfrak{a}(1, 3)$
- 3 de Rham (Co)homology
- 4 Topological electromagnetism

Motivation

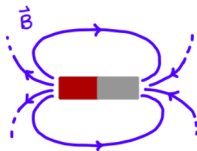
plasmas and what not

Maxwell's Equations

Gauss's Laws

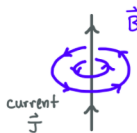


$$\vec{\nabla} \cdot \vec{E} = \rho(\vec{x}, t)$$



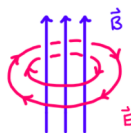
$$\vec{\nabla} \cdot \vec{B} = 0$$

Ampere's Law



$$\vec{\nabla} \times \vec{B} - \frac{\partial \vec{E}}{\partial t} = \vec{J}(\vec{x}, t)$$

Faraday's Law



$$\vec{\nabla} \times \vec{E} + \frac{\partial \vec{B}}{\partial t} = 0$$

Section 2

Lorentzian Geometry

stuff

Section 3

Poincaré Group

symmetries of lorentz space.

Section 4

de Rham (Co)homology