Abstract

A model of inflation is presented where the inflation field is a complex scalar field coupled to a U(1) gauge field. Due to the axial symmetry of the potential, the inflation is driven by the radial direction while the angular field is gauged by U(1). Due to the coupling of the inflation to the gauge field, a time dependent mass term for the gauge field is generated dynamically and conformal invariance is broken. We study whether a significant amount of the primordial magnetic fields can be generated during inflation by allowing a time-dependent U(1) gauge kinetic coupling.