

Abstract Submitted
for the 4CS21 Meeting of
The American Physical Society

Kibble mechanism for electroweak magnetic monopoles and magnetic fields TEERTHAL PATEL, TANMAY VACHASPATI, Arizona State University — Magnetic fields are known to exist throughout the Universe on scales ranging from stars to that of galaxies and galactic clusters. Indications of their presence on cosmological scales by blazar observations have motivated studies into a primordial origin. We studied one such promising candidate, the electroweak phase transition (EWPT) in the early Universe. Magnetic monopoles and strings that connect them arise in electroweak theory of the standard model and their subsequent annihilation can be thought to leave behind relic cosmological magnetic fields. The Kibble mechanism has been used to study topological defect formation during a phase transition, most notably in the context of cosmic strings. We have adopted a suitably modified Kibble mechanism to study EWPT and the resulting properties of the monopoles, strings and magnetic fields are discussed in this work. The initial conditions obtained through this analysis can be used for further evolution and thus presents an opportunity to probe EWPT using a cosmological observable.

Teerthal Patel
Arizona State University

Date submitted: 10 Sep 2021

Electronic form version 1.4