Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Generation of magnetic field in a first-order electroweak phase transition YIYANG ZHANG, FRANCESC FERRER, Washington University in St. Louis, TANMAY VACHASPATI, Arizona State University — We study the generation of magnetic field during a first-order electroweak phase transition by evolving the classical equations of motion. The bubble production is done by a simple random nucleation scheme, controlled by a nucleation probability p_b, related to the quantum tunneling rate. The Higgs orientations of different bubbles are randomly and uniformly distributed on a 3-sphere. A damping term is introduced to damp the physical Higgs degree of freedom. We find magnetic field is generated during the phase transition, the strength of which is related to p_b and the strength of the Higgs damping. Furthermore, we discuss the factors controlling the shape of the spectrum of the generated magnetic field.

Yiyang Zhang
Washington Univ

Date submitted: 11 Jan 2018 Electronic form version 1.4