

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Simulating Electroweak Baryogenesis in the Standard Model ANDREW BLAIKIE, R. MIKE WINTERS, The College of Wooster, DEVA O'NEIL, Bridgewater College — One explanation for the abundance of matter over anti-matter in the universe is Electroweak Baryogenesis, which proposes that an excess of baryons was created during the electroweak phase transition, when particles first acquired mass. This transition, which occurred about one-tenth of a nanosecond after the Big Bang, proceeded through bubble nucleation, with the walls of the “bubbles” expanding until the electroweak symmetry was broken everywhere in space. We modeled this process in Mathematica using the Standard Model. Although current mass limits for the Higgs boson rule out Electroweak Baryogenesis in the Standard Model, our simulation can provide the basis for modeling more sophisticated scenarios. We used the sonification software SuperCollider to create an audio representation of the growth of the bubbles.

John Lindner
The College of Wooster

Date submitted: 30 Nov 2010

Electronic form version 1.4