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Signals of the Doomsday

Abstract

Precise Standard Model loop calculations of the Higgs potential indicate that we live in a meta-stable stable state with the lifetime of many billion years. Ultimately, our universe will tunnel into the true vacuum state, in a process that would most likely represent the end of the universe as we know it. However, once gravity is included into calculations, small primordial black holes (as impurities) can serve as the phase transition catalyzers, and render the lifetime dangerously short. Since the first order phase transition proceeds via bubble nucleation, it would be very important to know the observable signature of the true vacuum bubble creation in our universe. We find the characteristic spectrum of gamma rays that, if ever observed, might represent a signal of the doomsday.