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New Gravitational Wave Signatures of Theories with Extended Gauge Symmetries

Abstract

Early Universe gravitational waves provide a very promising avenue for probing particle physics models. They are especially relevant for testing theories with extended gauge symmetries, which, through symmetry breaking, predict a stochastic gravitational wave background from first order phase transitions, cosmic strings and domain walls. Recently, it was shown that also symmetry restoring phase transitions may lead to a measurable gravitational wave signal, offering a way to probe the physics of reheating. Concentrating on a particular model, I will demonstrate how current and upcoming gravitational wave experiments can be used to probe high energy physics, perhaps shedding light on some of the open questions in particle physics.