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Gravitational waves from Standard Model*Axion*Seesaw*Higgs portal inflation

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Standard Model-Axion-Seesaw-Higgs portal inflation (SMASH) is a minimal extension of the Standard Model that provides a solution to five problems of particle physics and cosmology (inflation, baryon asymmetry, neutrino masses, strong CP problem, and dark matter) in one stroke. An important prediction of this model is the existence of a significant amount of primordial gravitational waves (GWs) that are originated from tensor fluctuations during inflation, and such GW signatures can be probed both indirectly by upcoming cosmic microwave background polarization experiments and directly by future space-born GW interferometers. In this contribution, we point out that the SMASH model indeed gives a non-trivial and unique prediction for the nature of the second order Peccei-Quinn phase transition, which is imprinted on the spectrum of primordial GWs in a frequency range relevant to future high-sensitivity GW experiments. After presenting the analysis on the spectrum of GWs in the SMASH model, we discuss the possibility to probe it in the future GW direct detection experiments.

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