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From Hubble to Bubble - curvature induced phase transitions after inflation

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The prospect of primordial gravitational waves (GW) offers a promising new window for inflationary cosmology and particle physics. In our study 2309.08530, we investigated the evolution of the potential of a minimal scalar BSM extension at the end of inflation. More specifically, we focused on the transition from the potential-dominated de Sitter epoch to the kinetic dominated period of kination. In this setting, a strong first-order phase transition can take place due to the sign change of the curvature scalar, which the BSM field is non-minimally coupled with. Therefore, an amplified GW spectrum can be produced from the collision of true-vacuum bubbles during kination. With this prescription, we propose a new triggering mechanism for BSM phase transitions that could be potentially observable with future detectors. Finally, I will present a connection of this mechanism with a Higgs-portal dark matter model that we are currently investigating at FCUP.

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