Contribution ID: **352** Type: **not specified**

Gravitational Wave Echo of Relaxion Trapping

Tuesday 24 August 2021 17:40 (20 minutes)

In order to solve the hierarchy problem, the relaxion must remain trapped in the correct minimum, even if the electroweak symmetry is restored after reheating. In this scenario, the relaxion starts rolling again until the back-reaction potential, with its set of local minima, reappears. Depending on the time of barrier-reappearance, Hubble friction alone may be insufficient to re-trap the relaxion in a large portion of the parameter space. Thus, an additional source of friction is required, which might be provided by coupling to a dark photon. The dark photon experiences a tachyonic instability as the relaxion rolls, which slows down the relaxion by backreacting to its motion, and efficiently creates anisotropies in the dark photon energy-momentum tensor, sourcing gravitational waves. We calculate the spectrum of the resulting gravitational wave background from this new mechanism, and evaluate its observability by current and future experiments. We further investigate the possibility that the coherently oscillating relaxion constitutes dark matter and present the corresponding constraints from gravitational waves.

Authors: BANERJEE, Abhishek (Weizmann Institute of Science); Dr MADGE, Eric (Weizmann Institute of Science); PEREZ, Gilad (Weizmann Institute); SCHWALLER, Pedro; RATZINGER, Wolfram (Johannes Gutenberg Universität Mainz)

Presenter: Dr MADGE, Eric (Weizmann Institute of Science)

Session Classification: Gravitational Waves as Probes for New Physics

Track Classification: Gravitational Waves as Probes for New Physics