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Gravitational wave energy budget in strongly supercooled phase transitions

Monday 1 July 2019 09:45 (20 minutes)

I will discuss efficiency factors for the production of gravitational waves through bubble collisions and plasma-related sources in strong phase transitions, and the conditions under which the bubble collisions can contribute significantly to the signal. I will also show that generically the sound-wave period is much shorter than a Hubble time leading to a reduction of GW signal produced by sound waves and possibly suggesting a significant amplification of the turbulence-sourced signal. I will illustrate our findings in two examples, the Standard Model with an extra $|H|^6$ interaction and a classically scale-invariant $U(1)_{\mathrm{B-L}}$ extension of the Standard Model. The contribution to the GW spectrum from bubble collisions is found to be negligible in the $|H|^6$ model, whereas it can play an important role in parts of the parameter space in the scale-invariant $U(1)_{\mathrm{B-L}}$ model.

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