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Oscillons after inflation and gravitational waves

The spherically-symmetric soliton named oscillon emerges from the violent instability of the inflaton during the (p)reheating epoch, and has a potential to alter the cosmic expansion history in the epoch. For instance, if the oscillons decay soon after their formation, the (p)reheating epoch is terminated much earlier than expected, and therefore the e-fold number corresponding to the current CMB scale would be changed. This change causes to alter the theoretical predictions of inflation models such as the spectral index (n_s) and the tensor-to-scalar ratio (r). In particular, the alpha-attractor model known as one of the viable inflation models would be no longer working. In this talk, we investigate the oscillon formation with a variety of inflaton potentials using the three-dimensional field-theoretic simulations, and focus on to what extent the efficiency of the formation and the life of oscillons depend on the shape of potential.

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