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## Particle production in inflationary regimes

*Tuesday, 9 July 2024 15:00 (18 minutes)*

We investigate inflationary particle production, focusing in particular on the role of inflaton fluctuations and the corresponding geometric particle production arising from spacetime perturbations. We analyze both small and large-field models, in agreement with experimental observations, also discussing nonminimal coupling to the scalar curvature of spacetime. Geometric production is then compared to the widely studied mechanism of gravitational particle production, with particular emphasis on ultralight spectator scalar fields, which have been recently proposed as plausible dark matter candidates. The “geometric” particle density for such fields is computed assuming instantaneous reheating into a radiation dominated era, showing that the presence of inhomogeneities may have relevant effects on particle production mechanisms. Possible implications for primordial entanglement generation are also debated.

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