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Dark Matter Production from Preheating and Structure Formation Constraints

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In this talk I will discuss the production of scalar dark matter from the inflaton condensate during inflation and reheating. I will discuss the production regimes assuming that this scalar couples to the inflaton via a direct quartic coupling and gravity: purely gravitational, weak direct coupling (perturbative), and strong direct coupling (nonperturbative). For each regime, I will determine the dark matter phase space distribution, the corresponding relic abundance and derive the corresponding constraints from the Lyman- α forest measurement.

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