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Matter and Dark Matter from False Vacuum Decay

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We study tachyonic preheating associated with the spontaneous breaking of B-L, the difference of baryon and lepton number. Reheating occurs through the decays of heavy Majorana neutrinos which are produced during preheating and in decays of the Higgs particles of B-L breaking. Baryogenesis is an interplay of non-thermal and thermal leptogenesis, accompanied by thermally produced gravitino dark matter. The proposed mechanism simultaneously explains the generation of matter and dark matter, thereby relating the absolute neutrino mass scale to the gravitino mass.

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