

# Quantum Interference in a Thermal Bath

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Thermal leptogenesis explains the observed matter-antimatter asymmetry of the universe in terms of neutrino masses, consistent with neutrino oscillation experiments. We present a full quantum mechanical calculation of the generated lepton asymmetry based on Kadanoff-Baym equations. Origin of the asymmetry is the departure of the statistical propagator of the heavy Majorana neutrino from the equilibrium propagator, together with CP violating couplings. The lepton asymmetry is calculated directly in terms of Green's functions without referring to 'number densities'. A detailed comparison with Boltzmann equations shows that conventional leptogenesis calculations have an uncertainty of at least one order of magnitude.

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