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Neutrino interaction rates at MeV temperatures and their role in decoupling

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The dynamics of neutrinos and antineutrinos at MeV temperatures sets the Standard Model prediction for the effective number of relativistic species, N_{eff} , a key target for upcoming CMB and BBN measurements. Reaching a suitable theoretical accuracy demands control over sub-percent effects in the relevant interaction rates. In this talk I will review recent progress on precision calculations of neutrino production, annihilation, and scattering rates in a QED plasma, including next-to-leading order corrections, thermal effects, and electron mass corrections, and comment on how such rate coefficients serve as input for non-equilibrium neutrino kinetic equations. I will then present a fast, flexible, and accurate momentum-averaged framework, and outline its extension to BSM scenarios.

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Classification de Session: Neutrinos