

Semiclassical analysis of axion-assisted and axion-driven pair production

Tuesday, 7 December 2021 16:00 (20 minutes)

We study the pair production of fermions in a time dependent axion background with and without an electric background. We construct the adiabatic mode functions which incorporate the gauge field and the axion velocity dependence of the dispersion relation. The semiclassical approach using this adiabatic basis shows two types of pair production. One is axion-assisted pair production: the presence of the axion velocity gives enhancement and interference effects on the pair production driven by the electric field. The other is axion-driven pair production: the time variation of the axion velocity causes the pair production even though the electric field is absent.

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