Pair Creation, Backreaction and Resummation in Strong Fields

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Strong fields in scalar QED are studied from an initial coherent state of photons in which pair creation, backreaction, and resummation properties are discussed. From this picture I show how to construct observables, such as in-in expectation values, in terms of in-out amplitudes, and in so doing illustrate their connection as a resummation of an infinite number of disconnected loop diagrams. I show to next-to-leading-order the waveform, vacuum persistence, and the number of created photons. Also, a resummation is shown for total number of Schwinger created pairs leading to vacuum non-persistence.

References

[1] P Copinger, J P Edwards, A Ilderton and K Rajeev, Phys. Rev. D **111**, 036009 (2025); arXiv:2411.06203 (2024)