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Equivalence of Many-Mode Floquet Theory to Floquet Theory
ADAM POERTNER, JAMES MARTIN, University of Waterloo — Many Mode Floquet Theory (MMFT) [T.-S. Ho, S.-I. Chu, and J. V. Tietz, Chem. Phys. Lett. **96**, 464 (1983)] is an extension of Floquet Theory suitable for solving the time-dependent Schrödinger equation when an atom is exposed to multiple time-periodic fields, each with a different periodicity. Despite its success, the conditions for the applicability of MMFT are not well-established, particularly in the case where the frequencies of the applied fields are all low multiples of a common frequency. In this situation, questions arise regarding an over-complete basis. We clarify the applicability of MMFT by demonstrating its equivalence to Floquet Theory through a comparison of time evolution operators in the two approaches. These results are considered in the context of non-resonant dressing of Rydberg atoms with the purpose of reducing their sensitivity to low-frequency electric fields. [D. W. Booth, J. Isaacs, and M. Saffman, Phys. Rev. A **97**, 012515 (2018)]

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