

Abstract

The Floquet prescription for solving the time-periodic Schrödinger equation in oscillating fields involves a heavy diagonalization. In this work a new computational scheme is presented, which involves an analytical diagonalization of a uniform block tridiagonal matrix. This block diagonalization involves Coulson's expressions for eigenvalues and eigenvectors of a Hückel matrix for a linear polyene. The given method is found suitable for the high intensity- low frequency parameter regime of the oscillating field. The high intensity field is now built into the diagonal blocks of the Floquet matrix, thus resulting in zeroth order solutions, which are resonances in an oscillating field. However, in this basis, the diagonal number matrix, becomes off-diagonal. A further simplification in terms of maximal coupling involving the largest off-diagonal element is used to find positions and decay widths of the field induced resonances as function of field strength and oscillating frequency.