1.5 Adiabatic representation for the exchange inelastic electron-atom amplitude

R. K. JANEV, *Institute of Physics and Institute of Nuclear Sciences "Boris Kidrič", Beograd, Yugoslavia*
V. D. OB'EDKOV, *Leningrad State University, Leningrad, USSR*

Abstract

In order to eliminate the failures of the Born-Oppenheimer exchange inelastic electron -atom amplitude a unitary transformation is made of the standard adiabatic perturbational series. As the basis of the new representation are taken the adiabatical functions $\chi=A\Phi$, which at large distances lead to atomic eigenfunctions basis $\{\Phi\}$, $(A\rightarrow I)$. The unitary transformation matrix A is found in the two-state approximation. In this representation the Born-Oppenheimer amplitude does not violate the conservation laws. Expanding this amplitude in an asymptotic series the Ochkur amplitude is found in the adiabatical representation. It is shown that this amplitude is non-unique in respect to any unitary transformation satisfying the condition $A\rightarrow I$ at large distances.

1.6 Padé approximants in electron-atom scattering

C. R. GARIBOTTI and P. A. MASSARO, *Istituto di Fisica dell'Università, Bari, Italia*

1. Introduction

In the elastic electron-atom scattering at high and intermediate energies the effects of nonadiabatic distortion of the atomic wave function by the incident electron are very important in order to describe correctly the angular distribution which is sharply peaked in the forward direction. For the elastic e^-—He scattering recent partial wave calculation have been performed by La Bahn and Callaway[1] using an "extended polarization potential". Their results agree with the absolute experimental data of Vrieus et al.[2] as normalized by Chamberlain et al.[3] in the energy range 100—300 eV. But when the energy increases their method does not work so well and an enormous computational work is demanded to obtain stable results.

Another approach is to describe the distortion effects through use of the second Born order f_2 (θ, E). In this paper first we compare various approximations for the cross section considering the elastic $e^{\pm}$—H scattering and the nwe extend the results obtained in a previous paper[4] using the Padé approximants method in the elastic e^--He scattering.