

Dominant Correlation Effects in Atomic Spectra

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Abstract : High double excitation of two-electron atoms has been investigated using hyperpherical coordinates within a modified adiabatic expansion technique. This modification creates a novel fictitious force leading to a spontaneous exchange symmetry breaking at high double excitation. The Pauli principle must therefore be regarded as approximation valid only at low excitation energy. Threshold electron scattering from high Rydberg states shows an unexpected time reversal symmetry breaking. At threshold for double escape we discover a broad (few eV) Cooper pair.

Keywords : correlation, resonances, threshold ionization, Cooper pair

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