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### 1.7 Adiabatic representation calculations of the H (1s) —H (2 s) exchange excitation by electrons

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#### *Abstract*

In the adiabatical representation calculations are made on exchange excitation of hydrogen atom by electron impact. The differential and total exchange excitation of 2s state are calculated in Ochkur approximation using the proper adiabatical two-state basis and the quasi-adiabatical one. The difference in the two total exchange cross sections is negligible except for the part in the region about the cross section maximum. The total exchange cross section lies below the experimental one and is in better agreement with it than the cross section of the three-state close-coupling approximation.

### 1.8 Reaction rate coefficient for radiative attachment of electrons on H and alkali atoms

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#### *Abstract*

The radiative electron attachment process  $e + A(^2S_{1/2}) \rightarrow A^{-}(^1S_0) + h\nu$  is studied in the electric-dipole transition approximation. The transition matrix element  $\langle \psi_b | z | \psi_E \rangle$  is calculated using various representations for the bound- and free-state electron wave functions  $\psi_b$  and  $\psi_E$ . The averaging of the cross section of reaction (1) is taken over a Maxwellian distribution function in order to get the reaction rate coefficient. All integrations can be carried out analytically. The reaction rate coefficients in all representations are expressed in terms of confluent hypergeometric functions.