INFLUENCE OF ELECTRON DEGENERACY ON BUOND STATES PARTITION FUNCTION

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Equation of state for a non-ideal hydrogen plasma and the HEOS code for modeling of the EOS were developed to account the influence of degenerated electrons on the contribution of bound states.

It was found that the estimate of BS contribution decreases by orders of magnitude due to account of electrons degeneracy (ED) in the case of large T ($>10^5$ K) and strong degeneracy ($\mu_e/T \square 1$).

Numerical simulations show that the adiabatic exponent value can differ significantly from the ideal gas value $\Gamma_1 = 5/3$ even for moderate nonideality ($\Gamma_1 \square 2$ for $\Gamma_D \square 4$)

For hydrogen plasma and conditions of the interior of the Sun the account of ED in BS contribution leads to correction of sound speed $<10^{-4}$ in comparison to model with SRM partition function.

Adiabatic exponent dependences on density obtained for constant temperatures using HEOS and SAHA-S codes for different sub-models are in close agreement.