Exciton dissociation in warm dense molecular hydrogen

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The transition from the molecular to the atomic state in warm dense fluid hydrogen has been the subject of active scientific research in the last few decades. The use of various experimental techniques has not yet led to reliable consistent results. Despite numerous attempts, theoretical methods have not yet been able to explain the existing discrepancies in the experimental data and the microscopic nature of the mechanism of transition of the hydrogen fluid to the conducting state. In [1] the importance of taking into account non-equilibrium non-adiabatic processes in the analysis of the mechanisms of the transition under consideration was shown. This work presents the results of calculations of the properties of exciton states formed as a result of spontaneous vibronic excitations. It is shown that the dissociation of such excitons at high temperatures can explain the experimentally detectable characteristics of the transition under consideration.

[1] Fedorov I D, Orekhov N D and Stegailov V V 2020 *Phys. Rev. B* **101** 100101