

Abstract Submitted
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Collision-Induced Infrared Absorption by Collisional Complexes in dense Hydrogen-Helium gas mixtures at Thousands of Kelvin¹ MARTIN ABEL, LOTHAR FROMMHOLD, The University of Texas at Austin, XIAOPING LI, KATHARINE L.C. HUNT, Michigan State University — The interaction-induced absorption by collisional pairs of H₂ molecules is an important opacity source in the atmospheres of the outer planets and cool stars. The emission spectra of cool white dwarf stars differ significantly in the infrared from the expected black-body spectra of their cores, which is largely due to absorption by collisional H₂-H₂, H₂-He, and H₂-H complexes in the stellar atmospheres. Using quantum-chemical methods we compute the atmospheric absorption from hundreds to thousands of kelvin [1]. Laboratory measurements of interaction-induced absorption spectra by H₂ pairs exist only at room temperature and below. We show that our results reproduce these measurements closely [1], so that our computational data permit reliable modeling of stellar atmosphere opacities even for the higher temperatures [1].

[1] Xiaoping Li, Katharine L. C. Hunt, Fei Wang, Martin Abel, and Lothar Frommhold, “Collision-Induced Infrared Absorption by Molecular Hydrogen Pairs at Thousands of Kelvin”, *International Journal of Spectroscopy*, vol. 2010, Article ID 371201, 11 pages, 2010. doi: 10.1155/2010/371201

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Martin Abel
The University of Texas at Austin

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