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**Surface States Mediated Interfacial Thermal Conductance across Metal-nonmetal Interfaces** JUN ZHOU, TINGYU LU, Center for Phononics and Thermal Energy Science, School of Physics Science and Engineering, Tongji University, Shanghai 200092, CHina, TSUNEYOSHI NAKAYAMA, Hokkaido University, Sapporo 060-0826, Japan, RONGGUI YANG, BAOWEN LI, Department of Mechanical Engineering, University of Colorado, Boulder 80309, USA — The thermal transport mechanisms across metal-nonmetal interfaces are of great interest. We point out that the interfacial thermal conductance across metal-nonmetal interfaces could be determined by the electron-phonon interaction mediated by the surface states near the interface. Our calculation results show that the interfacial thermal conductance across Pb/Pt/Al/Au-diamond interfaces are only slightly different among these metals. The reason is the pinning of Fermi energy near the interface. Our results are in good agreement with the experimental results of the thermal boundary conductance of metal-diamond interfaces observed by Stoner et al. [Phys. Rev. Lett. 68, 1563 (1992)] and by Hohensee et al. [Nature Commun. 6, 6578 (2015)].

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