407.
标题: Ultrafast dynamics of occupied quantum well states in Pb/Si(111)
作者: Rettig, L (Rettig, L.); Kirchmann, PS (Kirchmann, P. S.); Bovensiepen, U (Bovensiepen, U.)
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摘要: We investigate the ultrafast electron dynamics of occupied quantum well states (QWSs) in Pb/Si(111) with time-resolved photoemission spectroscopy. We find an ultrafast increase in binding energy of the QWSs driven by the optical excitation, while the electronic system is in a non-equilibrium state. We explain this transient energetic stabilization in the photoexcited state by an ultrafast modification of the Fermi level pinning, triggered by charge transfer across the Pb/Si interface. In addition, we observe the excitation of a coherent surface phonon mode at a frequency of similar to 2 THz, which modulates the QWS binding energy.
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地址: [Rettig, L.; Bovensiepen, U.] Univ Duisburg Essen, Fak Phys, D-47048 Duisburg, Germany
[Rettig, L.] Free Univ Berlin, Fachbereich Phys, D-14195 Berlin, Germany
[Kirchmann, P. S.] MPG, Fritz Haber Inst, Phys Chem Abt, D-14195 Berlin, Germany
[Bovensiepen, U.] Zentrum Nanointegrat Duisburg Essen CENIDE, D-47048 Duisburg, Germany
通讯作者地址: Bovensiepen, U (通讯作者),Univ Duisburg Essen, Fak Phys, Lotharstr 1, D-47048 Duisburg, Germany
电子邮件地址: uwe.bovensiepen@uni-due.de
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