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标题: Photomixing in topological insulator HgTe/CdTe quantum wells in terahertz regime
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摘要: We reveal that topological insulators (TI) HgTe/CdTe quantum well have a strong nonlinear optical property in the three-photon mixing. While the gapless surface state in TI can exhibit strong nonlinear effect due to the linear energy dispersion, the nonparabolic energy dispersion of the bulk state is responsible for the photo mixing effect reported here. To produce response at terahertz frequency regime from femtosecond electrical fields, the mixing efficiency is around 10(-4) comparable to that of nonlinear semiconductor crystals. The optimal temperature for this nonlinear effect is around 100K. The results suggest a potential application of TI in terahertz photonics. (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.4768781]
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