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Raman study of lattice instability in non-symmorphic topologica linsulator KHgSb D. CHEN, T.-T. ZHANG, C.-J YI, T. ZHANG, Y.-G SHI, H.-M. WENG, Z. FANG, P. RICHARD, H. DING, Institute of Physics, Chinese Academy of Sciences, W.-L. ZHANG, Rutgers University — In previously discovered topological insulators, edge or surface states appear as Dirac cones protected by time-reversal symmetry or symmorphic crystalline symmetry. As a new class of topological states, hourglass-like electronic surface states protected by non-symmorphic glide mirror symmetry have been predicted recently in KHgSb [1] and their existence supported by ARPES experiments [2]. In spite of a clear description of its electronic structure, the lattice dynamics of KHgSb, which plays an important role here, is unknown. In this work, we report the first polarized Raman scattering study of KHgSb. Our results suggest a lattice instability below $T^* = 150$ K. Accompanied with this structure instability, two-phonon excitations are enhanced. We also discuss the decomposition of the samples at high temperature and under high laser power. [1] Z. Wang *et al.*, Nature **532**, 189 (2016) [2] J.-Z. Ma *et al.*, Arxiv: 1605.06824 (2016)

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