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Observation of Single and Degenerated Charge Ordering in $IrTe_2$
HYO SUNG KIM, TAE-HWAN KIM, CALDES, IBS, POSTECH, Korea, SOORAN KIM, KYOO KIM, BYUNG IL MIN, CMTL, POSTECH, Korea, YONG-HEUM CHO, JUN JIE YANG, POSTECH, Korea, SANG-WOOK CHEONG, POSTECH, Korea, Rutgers, USA, HAN WOONG YEOM, CALDES, IBS, POSTECH, Korea, STM/STS TEAM, DFT CALCULATION COLLABORATION, SAMPLE SYNTHESIZE COLLABORATION — We investigate the intriguing broken symmetry low temperature phases of $IrTe_2$ using high-resolution scanning tunneling microscopy and spectroscopy. We experimentally separate the structural and electronic modulations of the stripe phase reported previously. This result clearly indicate the charge ordering in the surface Te layer, which is consistent with the expectation of the It dimerization and charge ordering model but unambiguously denies the charge-density-wave-and-soliton model. In addition, we observe a metastable honeycomb charge-ordered phase. This phase is thought to be a $3q$ state of the stripe phase in analogy with the $2q$ ($3q$) state description of the checkerboard charge order (the skyrmion spin order).

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