Supporting Information

Multiple Transitions of Charge Density Wave Order in Epitaxial Few-layered 1T′-VTe_2 Films

Tian Dai[1], Songdan Kang[1], Xingyuan Ma[1], Shuai Dang[1], Hongwei Li[1], Zilin Ruan[2], Wenqi Zhou[1], Ping Hu[3], Shuwei Li[1], Shuxiang Wu[1]* (wushx3@mail.sysu.edu.cn)

[1]*State Key Laboratory of Optoelectronic Materials and Technologies, School of Materials Science and Engineering, Sun Yat-Sen University, Guangzhou 510275, People's Republic of China*

[2]*School of materials Science and Engineering, Kunming University of Science and technology, Kunming, 650093, People's Republic of China*

[3]*School of Electronic Information and Electrical Engineering, Huizhou University, No.46, Yanda Road, Huizhou City, 516000, People's Republic of China*

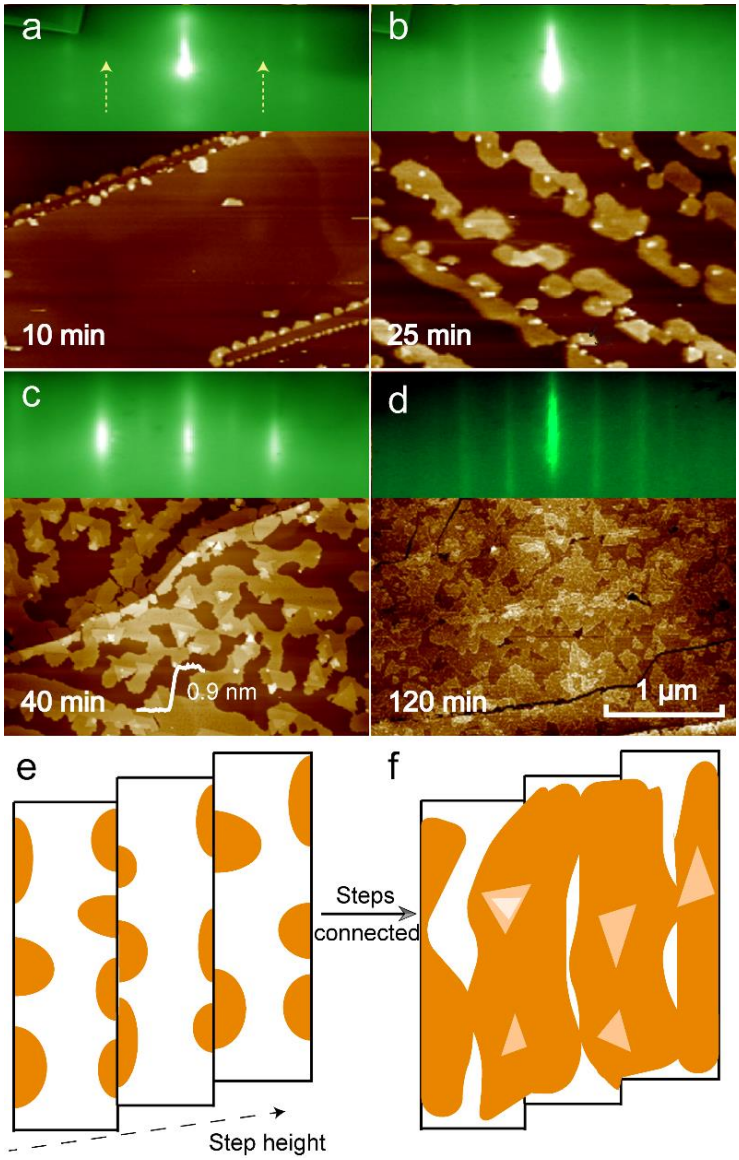

Figure S1. Surface topography measured by AFM and corresponding in situ RHEED patterns at different growth periods for the layer-by-layer epitaxial growth of VTe_2 thin films on HOPG substrates. (a) After growth of 10 min, RHEED streaks of VTe_2 films emerged and the coverage rate is approximately 3 %. (b) After growth of 25 min, with the coverage of ~40 %. (c) After growth of 40 min, the RHEED streaks of the substrates were disappeared and the monolayer VTe_2 film was obtained. (d) After growth of 120 min, shows an approximately 3 layer VTe_2 films with uneven coverage. (e), (f) Growth mode of VTe_2 films on HOPG.

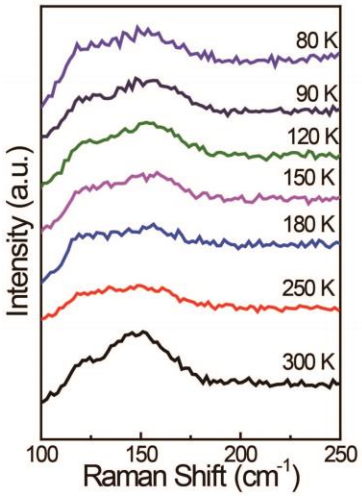

Figure S2. Temperature dependent Raman shift of monolayer VTe_2 films, the A_{1g} peak became too broad to identify the peak position, while the peaks are still detectable.

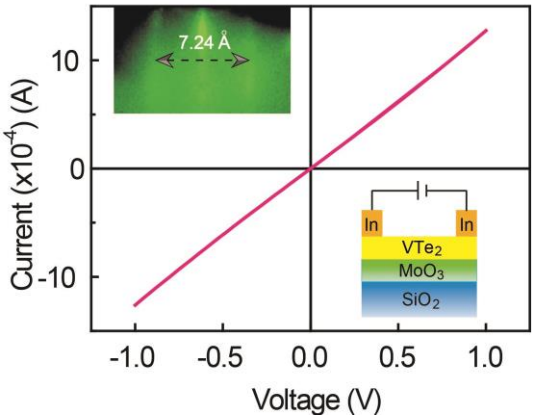

Figure S3. I-V curve and RHEED patterns of VTe_2 grown on MoO_3, indicating the same structure as VTe_2 grown on HOPG and graphene.