量子物理学・ナノサイエンス第 384 回セミナー

Evolution of the Fermi surface of 1T-VSe_2 across a structural phase transition

講師： **Dr. Turgut Yilmaz**

Department of Physics,
University of Connecticut, USA

日程： 3 月 15 日（金）11:00-

場所： 本館 2 階 290 物理学系輪講室

概　要

Two-dimensional (2D) layered transition metal dichalcogenides (TMDCs) display a variety of electronic, magnetic, and transport properties, making them widely studied materials[1]. Among the many TMDCs, 1T-VSe_2 gained special attention due to its three-dimensional charge density wave (3D-CDW) phase[2]. The structural distortion sets in at a transition temperature of 110 K presenting a 4a x 4a x 3c periodic superlattice. Early photoemission experiments viewed a shift of a secondary peak and a warping effect along the k_z direction as signatures of the CDW phase[3-5].

Here, we revisit the surface electronic structure of 1T-VSe_2 aiming to investigate the CDW phase in more detail. ARPES results virtually identical to the previous reports are reproduced. Additional states are also revealed that were not observed or predicted before. Furthermore, a prominent effect associated with the CDW phase is found in the shrinkage of the electron pocket centered at $\overline{M}'$-point at 100 ± 5 K. This observation is in excellent agreement with transport measurements. The new findings can clarify many of the electronic and transport anomalies of 1T-VSe_2.

Ref:

1. Manzeli, S. *et al*. Nat. Rev. Mater. **2,** 17033 (2017).
2. Tsutsumi, K. Phys. Rev. B **26**, 5756–5759 (1982).
3. Terashima, K. *et al.* Phys. Rev. B **68**, 155108 (2003).
4. Sato, T. *et al*. J. Phys. Soc. Jpn. **73**, 3331 (2004).
5. Strocov, V. N. Phys. Rev. Lett. **109**, 086401 (2012).

連絡教員　　平原　徹（内線 2365）