Ultrafast Dynamics in 2D Materials Investigated by Time-Resolved Photoemission Electron Microscopy

Two-dimensional (2D) materials with many potential applications have attracted lots of attention, many experimental methods have been applied on these materials. Due to the tens micrometres size scale, it is very hard for traditional methods without spatial resolution to locate the sample. Even more, the properties of monolayer 2D materials are very sensitive to surface defects, strains, impurities and even the substrate. The nanometres scale resolution become essential in 2D materials’ research. To achieve better performance in applications, the ultrafast measurement is very necessary in these materials. In this thesis, the home-build time-resolved photoemission electron microscopy (TR-PEEM) can provide sub-80-nm spatial resolution along with 46-fs temporal resolution, which is suitable to the researches on the 2D materials.

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Supervisor: Asst Prof Loh Zhi Heng