

Two-probe Measurement of CVD grown WSe₂ on SiO₂/Si by Using Conductive AFM Cantilevers

Ibuki Kuroda¹, Hiroyuki Mogi¹, Yuhei Takaguchi², Yasumitsu Miyata², Shoji Yoshida¹, Osamu Takeuchi¹ and Hidemi Shigekawa¹

¹Univ. of Tsukuba, ²Tokyo Metropolitan Univ.

In recent years, transition metal dichalcogenides(TMDCs) family has attracted much attention due to their remarkable properties for new device materials. In particular, Semiconductive TMDCs (WSe₂, MoS₂, etc.) have a band gap that decreases with increasing layer number. In this study, two conductive cantilevers were attached to multi-probe STM probe-holders, and we measured current-gate/drain voltage characteristics on monolayer(ML) and bilayer(BL) WSe₂ on the SiO₂/Si substrate with changing probe positions. As a result, we found that the current in case that probe positions are on ML/BL WSe₂ starts to flow at lower gate voltage than ML/ML. This results from changing of the Schottky barrier height at the probe/sample interface.

References:

¹⁾ K. F. Mak, et al *Phys. Rev. Lett.*, **105**, 136805 (2010)

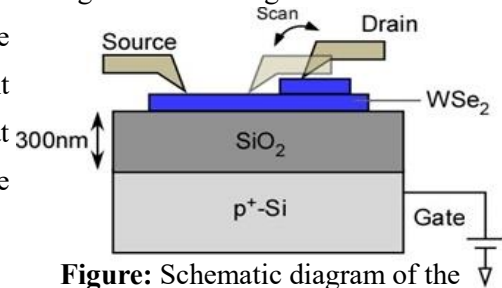


Figure: Schematic diagram of the experimental setup