2D Bi$_2$Se$_3$ van der Waals Epitaxy on Mica for Optoelectronics Applications

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Supplementary Materials

S1. AFM images of Bi$_2$Se$_3$ film of 90 nm thick.

![AFM image of Bi$_2$Se$_3$ film of 90 nm thick with a rms roughness of 17.8 nm.](image)

Figure S1. AFM images of Bi$_2$Se$_3$ film of 90 nm thick with a rms roughness of 17.8 nm.
S2. In-plane phi scan of Bi$_2$Se$_3$ on mica with buffer layer.

Figure S2. In-plane phi scan of Bi$_2$Se$_3$ on mica with buffer layer. Each diffraction peak can be deconvoluted into two peaks with an average FWHM of 13.8° indicated by the green dashed lines.

S3. UPS measurement of Bi$_2$Se$_3$.

Figure S3. UPS spectrum of Bi$_2$Se$_3$. The work function is calculated to be 4.43 eV.