

# CHALLENGES IN ABBERATION CORRECTED OFF-AXIS ELECTRON HOLOGRAPHY OF LAYERED TRANSITION METAL DICHALCOGENIDES

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## Abstract

A wide range of two-dimensional transition metal dichalcogenides with nominal composition  $\text{MX}_2$  (M: Mo, W, Re; X: S, Se) have been studied using medium and high resolution off-axis electron holography in spherical and chromatic aberration corrected transmission electron microscopes at accelerating voltages of 50, 60 and 80 kV.

Electron-optical phase images recorded using electron holography have been used to determine the number of layers in the flakes. Experimentally measured values of mean inner potential showed reasonable agreement with calculated values. The degree to which the layers and the number of atoms in each atomic column can be measured from phase images with high phase and spatial resolution will be discussed.

Possible challenges in such measurements include contamination, electron beam induced charging, stability of the sample and the instrument, residual aberrations and in situ damage of the sample (e.g. edge metallization, amorphization and missing atoms from the surface).