MS-2-P-5767 Setting up a Nanolab inside a TEM for 2D Materials research
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With the continuous improvement of in situ techniques inside transmission electron microscope (TEM), the capabilities of TEM extend beyond structural characterization to high-precision nanofabrication and property measurement. Based on the idea of "setting up a nanolab inside a TEM", we present our recent progress in 2D Materials research including in situ growth, nanofabrication with atomic resolution, in situ property characterization, nanodevice construction and possible applications (e.g. a 5nm-diameter hole on graphene for third-generation gene sequencing, the spongy graphene as an ultra-efficient sorbent for oils and organic solvents, etc.). Fig. 1 shows in situ nanofabrication of suspended molybdenum sulfide sub-nanometer ribbons with uniform width of 0.35 nm from monolayer MoS2 by electron beam irradiation. The mechanism of electron-beam induced high-resolution nanofabrication was also discussed.

References:

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Fig. 1: In situ fabrication of suspended molybdenum sulfide sub-nanometer ribbons with uniform width of 0.35 nm (possible narrowest molybdenum sulfide nanoribbon) from monolayer MoS$_2$ by electron irradiation.