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## Introduction to The Low-Dimensional Structure Probe at HEPS

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With the advancing of large-scale integrated circuits, the sizes of element devices have shrunk to nanoscale. At this size scale, quantum effects emerge and dominate the performance of the low-dimension materials and devices. To study the low-dimension structures and their dynamics based on coherent surface x-ray scattering (SXRS), we are constructing the Low-Dimension Structure Probe (LoDiSP) beamline at High Energy Photon Source (HEPS). It uses an in-vacuum undulator as the photon source, and connect the Multi-Environment X-ray Scattering station (EH1) and the In-situ Coherent Surface X-ray Scattering station (EH2) in tandem. At EH1, a large-load 6+3-circle Huber diffractometer equipped with various sample environment setups provides various x-ray scattering/diffraction methods. At EH2, a “hybrid MBE+SXRS+RHEED+XPCS” integrated facility enables in-situ growth of samples in ultra-high vacuum chamber and coherent SXRS characterization. An evanescent waves modulator will be developed to artificially transform the growth mode of multi-element compound thin films and be combined with grazing incident x-ray photon correlation spectroscopy (GI-XPCS) to investigate the surface dynamics of thin films.

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Instrumentation and methods

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