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Imaging strain distribution in monolayer transition metal dichalcogenides HONGCHAO XIE, ZEFANG WANG, KIN FAI MAK, JIE SHAN, Department of Physics, Pennsylvania State University — Atomically thin transition metal dichalcogenides (TMDs) have demonstrated many remarkable optical and electronic properties that are of interest from the viewpoint of both fundamental studies and potential applications. Because of the atomic thickness, these materials can also withstand large mechanical deformation, presenting an effective handle for engineering of their physical properties. Control and measurement of strain in atomically thin TMDs is thus needed. In this work, we develop a device structure that can continuously tune the strain level in suspended TMD membranes by an electrostatic force and a hyperspectral imaging method that can map the spatial distribution of strain. As an example, results on strain engineering of the optical properties of monolayer WSe2 will be presented.

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