Supplementary Information

Thickness-induced metal-semiconductor transition in LaH_2 epitaxial thin film grown by reactive rf-magnetron sputtering

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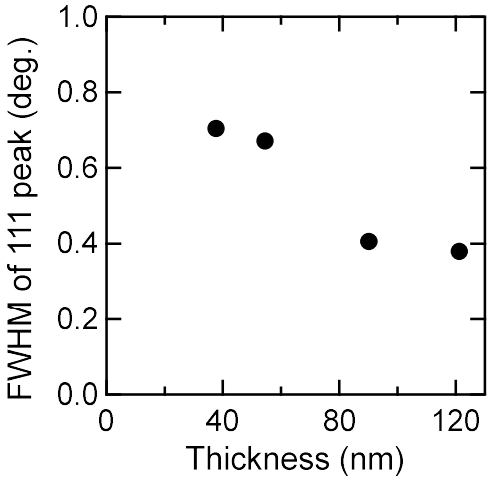

Fig. S1 Full width at half maximum (FWHM) of the 111 diffraction peak for LaH_2 epitaxial thin films.

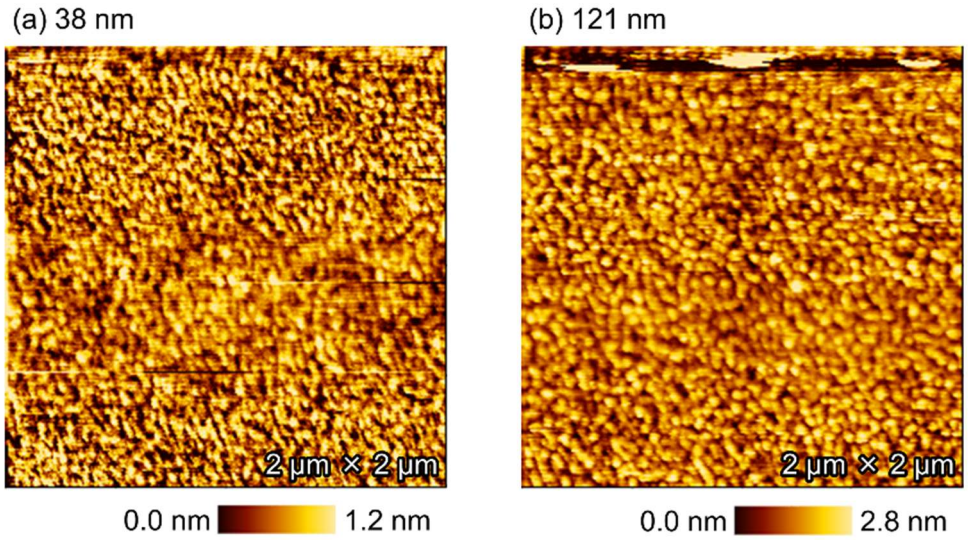

Fig. S2 Atomic force microscope images for LaH_2 epitaxial thin films with the thickness of (a) 38 and (b) 121 nm. Root mean square roughness was 0.36 and 0.82 nm for the thickness of 38 and 121 nm, respectively.

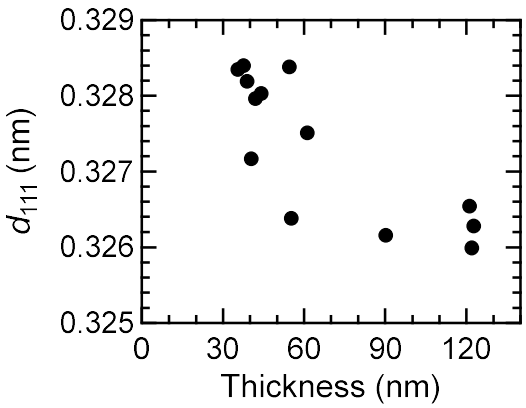

Fig. S3 Thickness dependence of lattice spacing $d_{111}$for LaH_2 epitaxial thin films as a function of thickness.

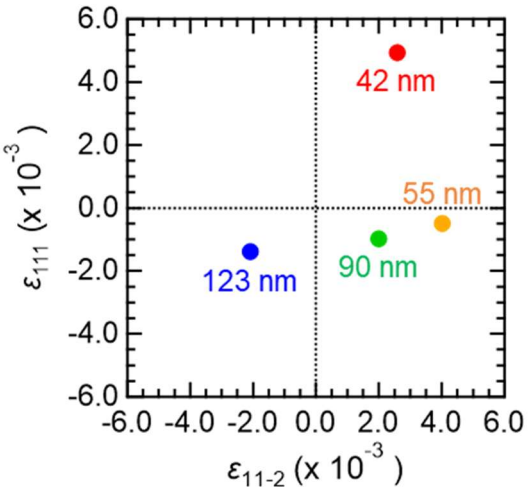

Fig. S4 Mapping of out-of-plane and in-plane strain for LaH_2 epitaxial thin films with different thickness.

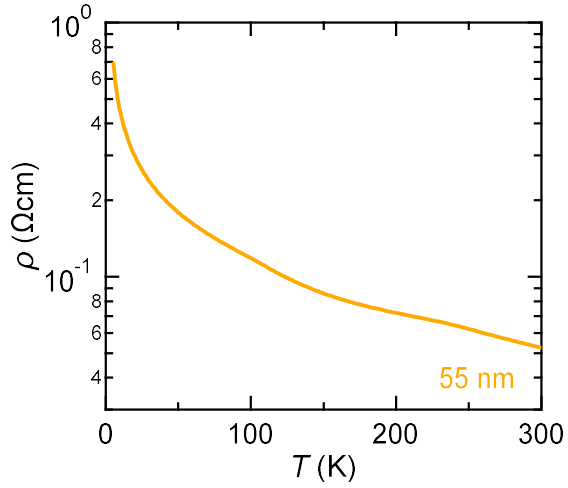

Fig. S5 Temperature dependence of electrical resistivity of LaH_2 epitaxial thin films with the thickness of 55 nm.