Supplementary Materials for

Interface Ferromagnetism and Anomalous Hall Effect in CdO/Ferromagnetic Insulator Heterostructures

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Figure S1

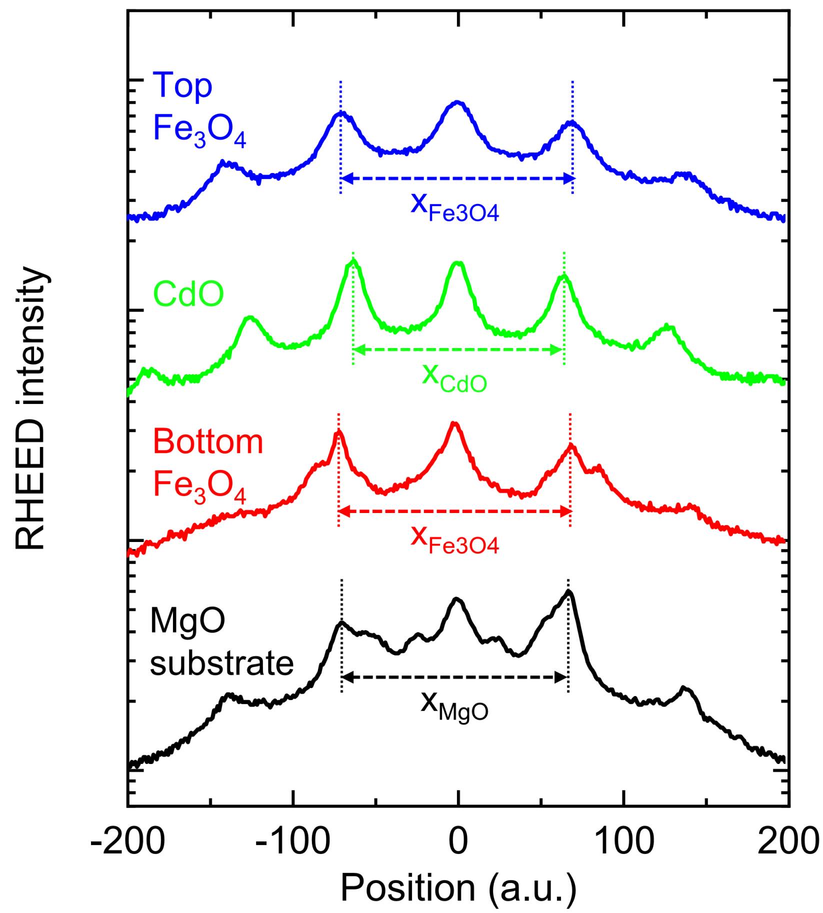

Fig. S1. Line cuts of the RHEED images for the Fe_3O_4/CdO (15 UC)/Fe_3O_4 heterostructures. Line cuts of RHEED intensity of MgO substrate (black), Bottom Fe_3O_4 (red), CdO (green) and Top Fe_3O_4 (blue) layers, respectively. The spacing between the major RHEED intensity peaks for each layer are labeled as X_{MgO}, X_{Fe3O4} and X_{CdO}.

Table S1

	Spacing (X)	Bulk lattice constant (nm)	Film lattice constant (nm)	Strain
Top Fe_3O_4	141	0.8380	0.8185	2.33% (Compressive)
CdO	128	0.4695	0.4508	3.98% (Compressive)
Bottom Fe_3O_4	141	0.8380	0.8185	2.33% (Compressive)
MgO substrate	137	0.4212		

Table S1. Strain analysis of the Fe_3O_4 and CdO layers of the Fe_3O_4/CdO (15 UC)/Fe_3O_4 heterostructures. The estimation of the strains is obtained based on the line cuts of RHEED intensities (Fig. S1) and using the lattice constant of MgO substrate (a = 0.4212 nm) as a reference.

Figure S2

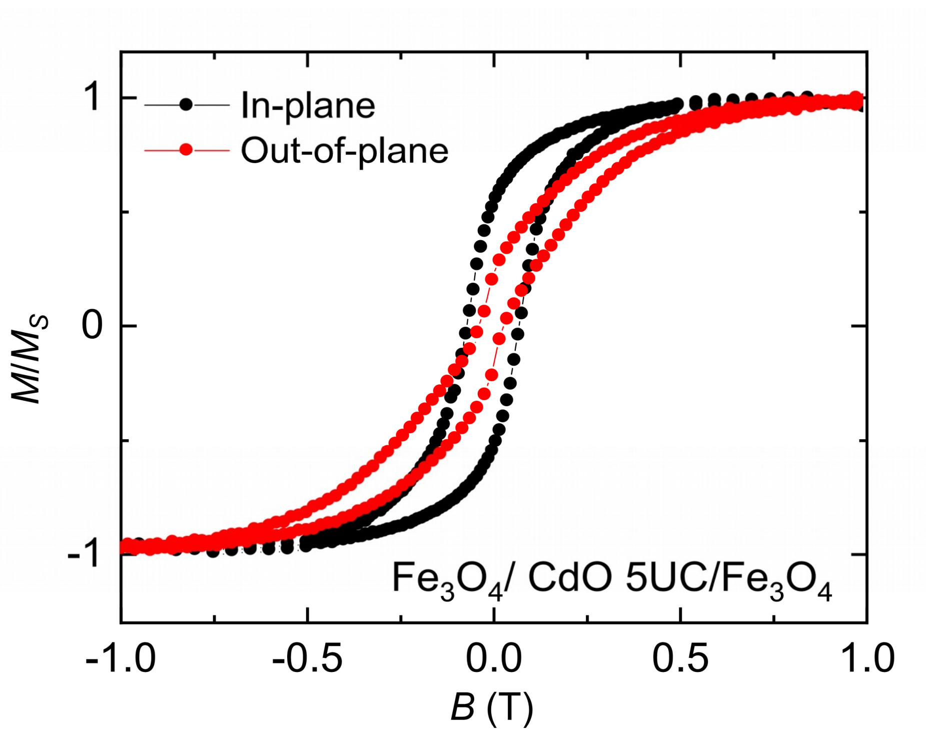

Fig. S2. Typical magnetization measurement of the Fe_3O_4/CdO/Fe_3O_4 trilayer heterostructures. The magnetization easy axis is in-plane.

Figure S3

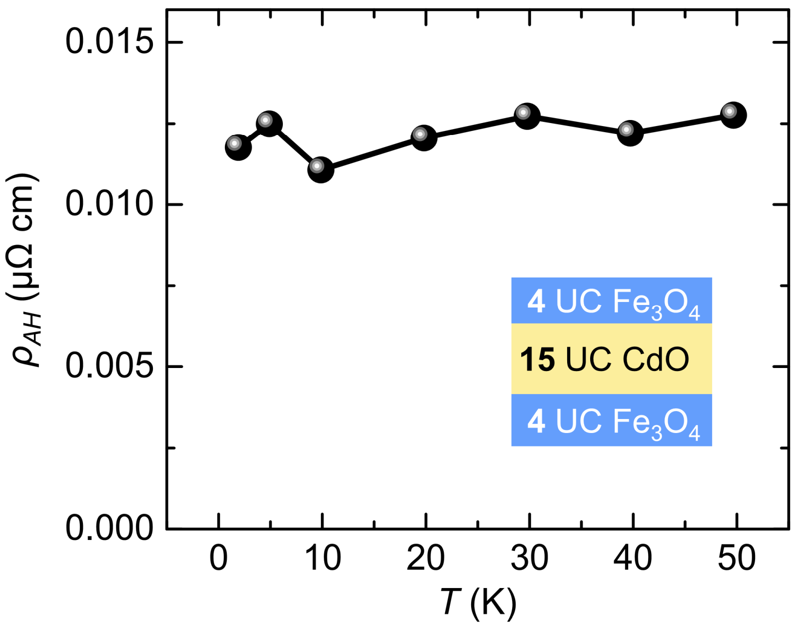

Fig. S3. Temperature dependence of anomalous Hall resistivity measured on the Fe_3O_4/CdO (15 UC)/Fe_3O_4 trilayer heterostructures.

Figure S4

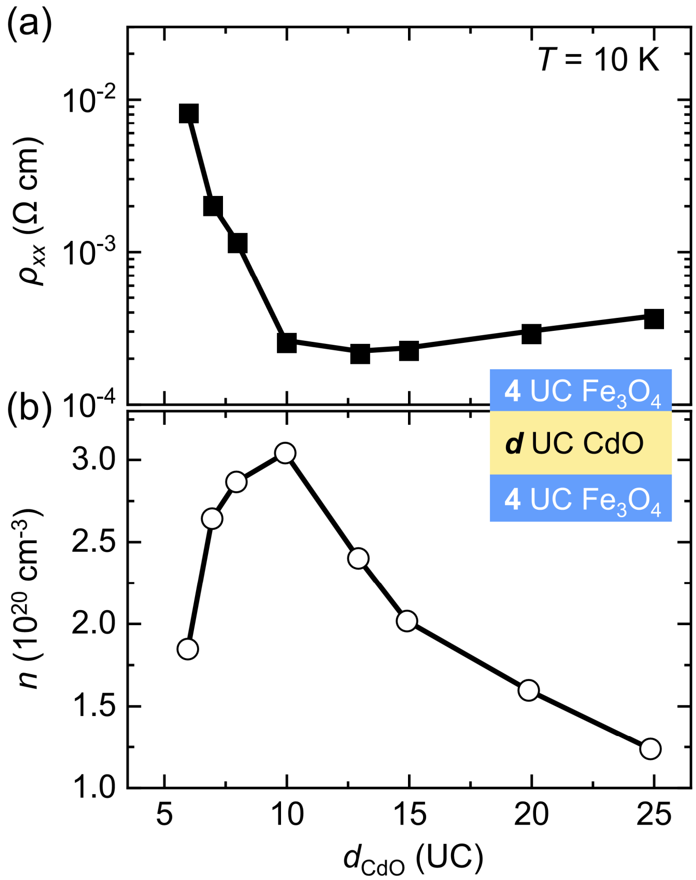

Fig. S4. CdO thickness dependence of the channel resistivity (a) and carrier density (b) for the Fe_3O_4/CdO (d UC)/Fe_3O_4 heterostructures. These results are obtained at T = 10 K.

Figure S5

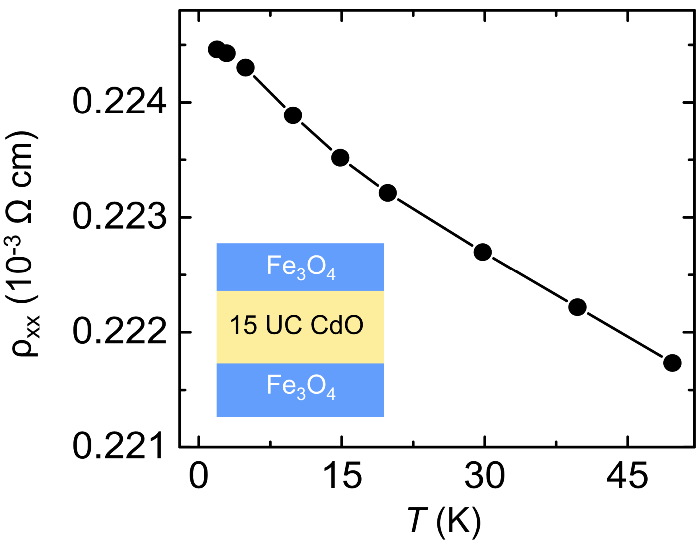

Fig. S5. The temperature dependence of the channel resistivity versus temperature for the Fe_3O_4/CdO (15 UC)/Fe_3O_4 trilayer heterostructures. A semiconducting behavior is observed at low temperatures.

Figure S6

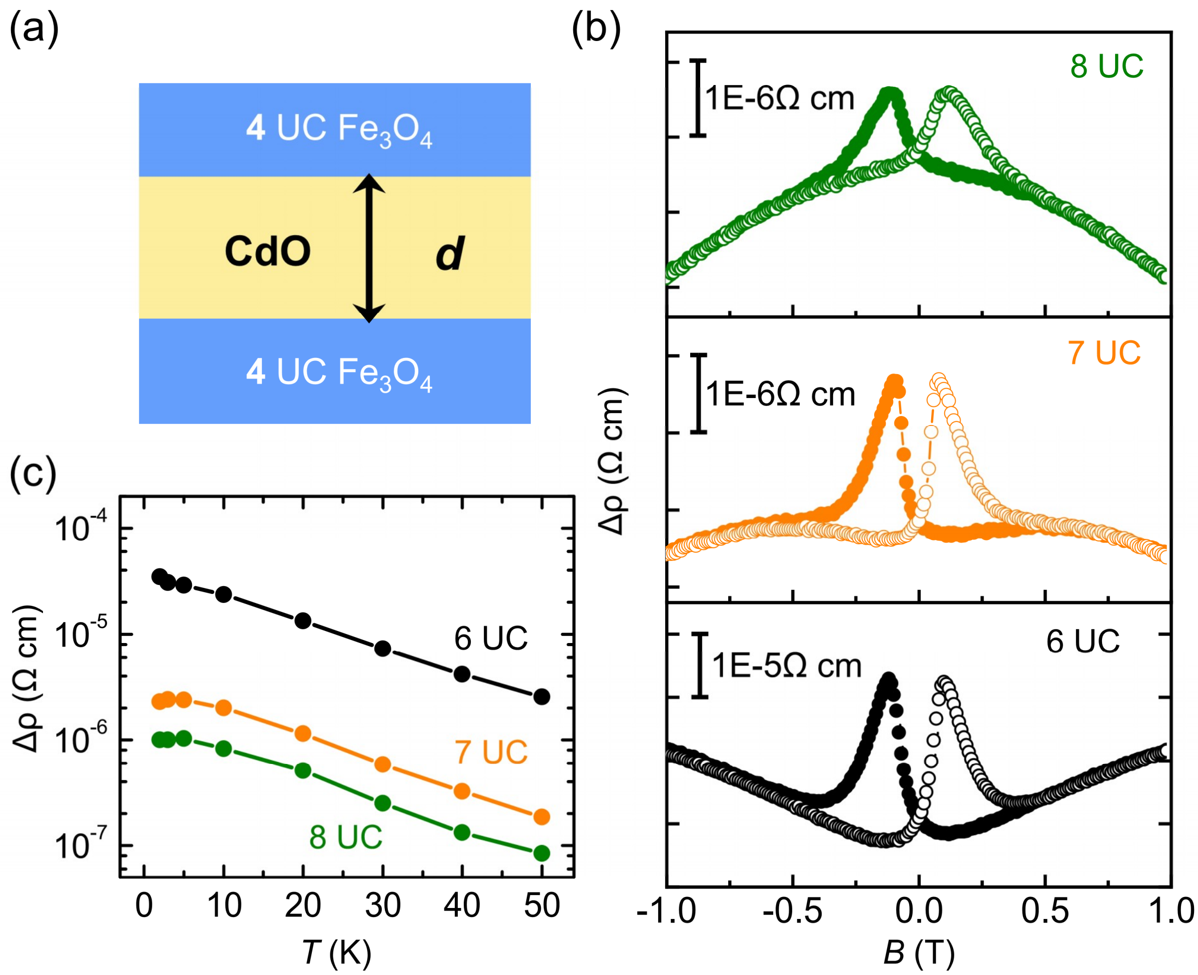

Fig. S6. CdO thickness dependence of the planar MR of the Fe_3O_4/CdO/Fe_3O_4 trilayer heterostructures. (a) Schematic of Fe_3O_4/CdO (*d* UC)/Fe_3O_4 heterostructures. (b) Planar MR curves as a function of in-plane magnetic field measured on Fe_3O_4/CdO (6, 7, and 8 UC)/Fe_3O_4 samples. (c) MR ratio ($\Delta\rho/\rho_{B=0}$) as a function of temperature for Fe_3O_4/CdO (6, 7, and 8 UC)/Fe_3O_4 samples.

Figure S7

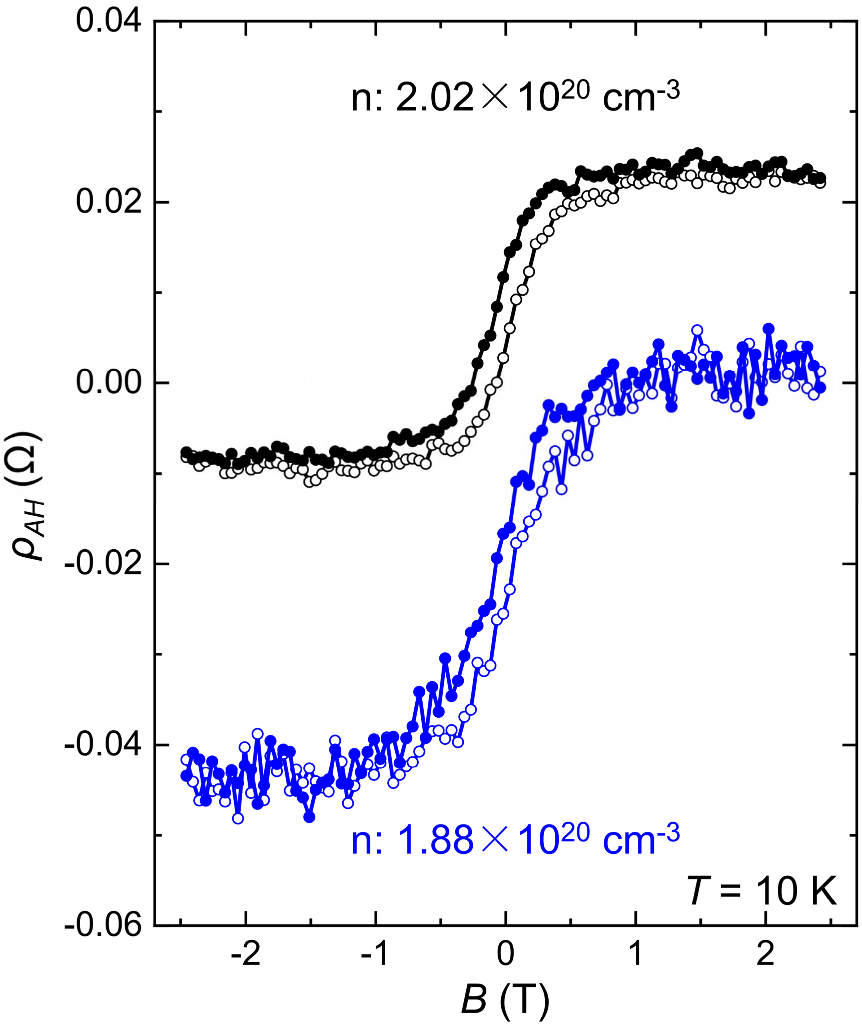

Fig. S7. AHE results of Fe_3O_4/CdO (15 UC)/Fe_3O_4 heterostructures after decreasing the Cd growth rate and post-annealing in oxygen. A slight larger anomalous Hall resistivity (blue) is observed on Fe_3O_4/CdO (15 UC)/Fe_3O_4 heterostructures compared to the previous results (black) showed in the main paper (Fig. 2(b)). The carrier density is only slightly reduced (~ 7%).