

Supporting Information for Magnetic Simulations of Core-Shell Ferromagnetic Bi-Magnetic Nanoparticles: The Influence of Antiferromagnetic Interfacial Exchange

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Supplementary figures

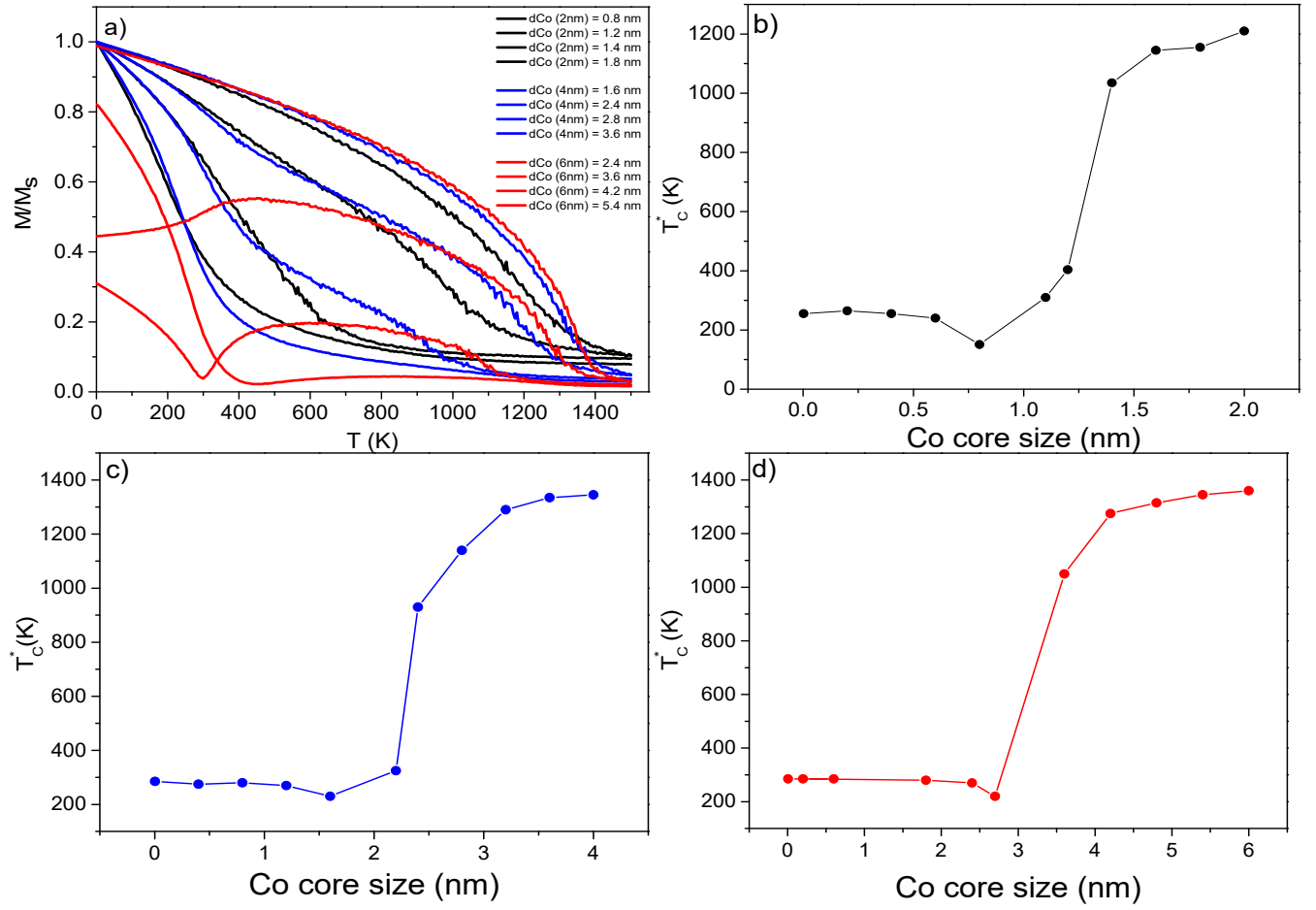


Figure S1. Normalized $M(T)/M_S$ curves for the core-shell bi-magnetic Co@Gd NP with total diameter of 2, 4, and 6 nm (a) for a positive interfacial exchange. Dependence of the T_c^* on the Co core size for a total particle size: 2 nm (b), 4 nm (c), and 6 nm (d).

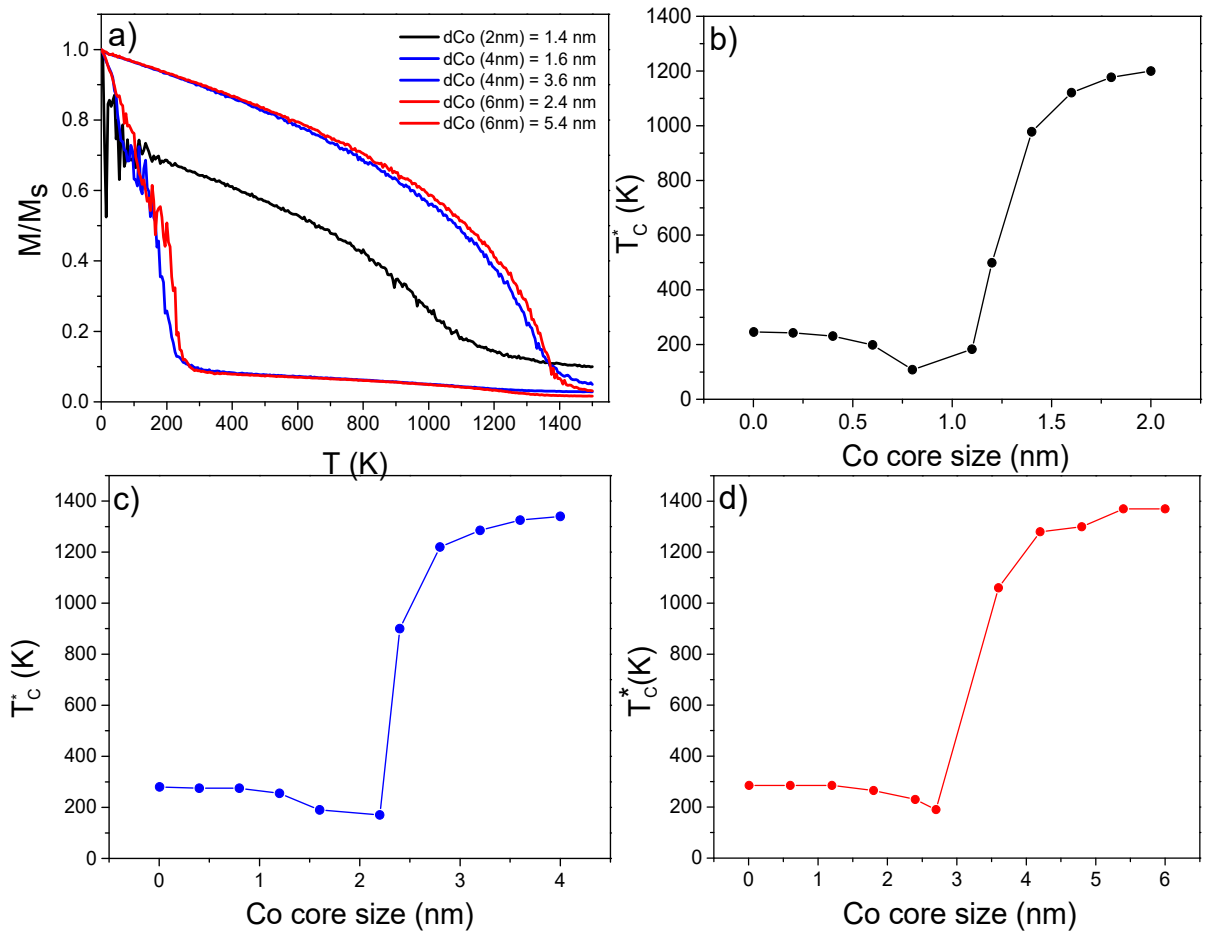


Figure S2. Normalized $M(T)/M_S$ curves for the core-shell bi-magnetic Co@Gd NP with total diameter of 2, 4, and 6 nm (a) for a zero interfacial exchange. Dependence of the T_C^* on the core Co size for a total particle size: 2 nm (b), 4 nm (c), and 6 nm (d).

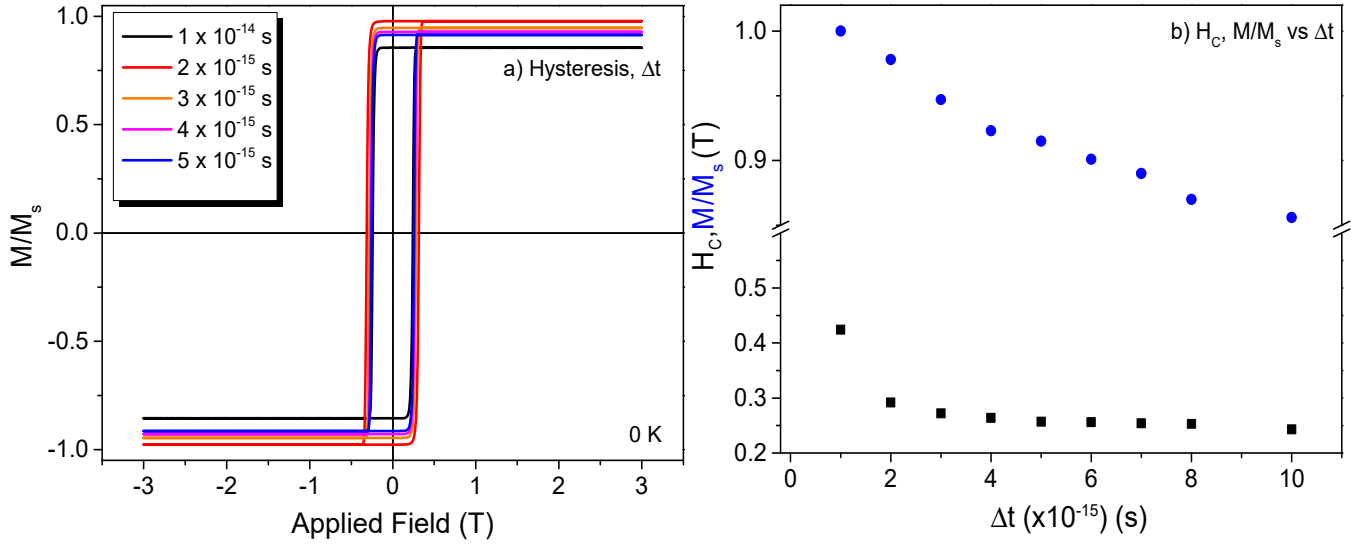


Figure S3. Normalized $M(H)$ curves under different Δt values at 0 K (a) and Δt dependence of the H_c and M/M_s parameters (b).

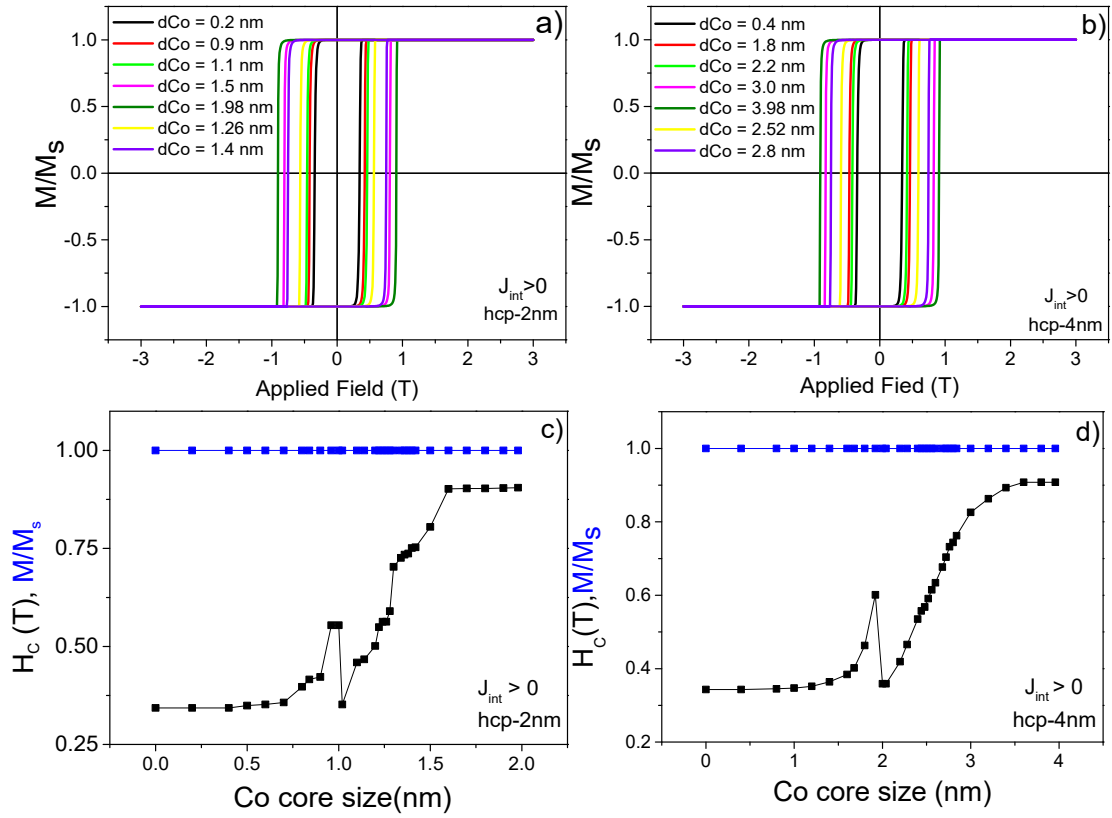


Figure S4. Normalized $M(H)/M_s$ curves for Co core size for a total core-shell size of 2 nm (a) and 4 nm (b) for positive interfacial exchange constant. Dependence of the Co core size of the H_c and M/M_s values for 2 nm (c) and 4 nm (d).

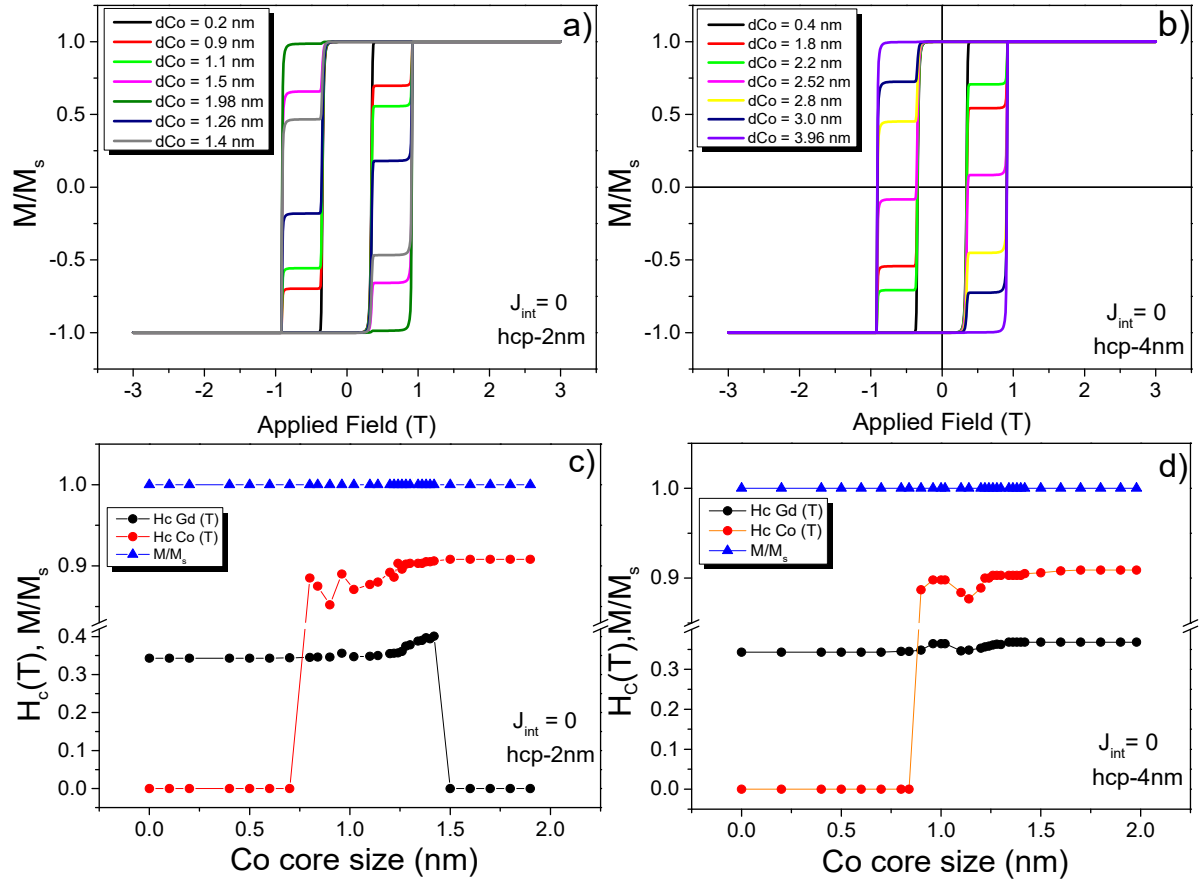


Figure S5. Normalized $M(H)/M_s$ curves for different Co core size for a total core-shell size of 2 nm (a) and 4 nm (b) for zero interfacial exchange constant. Dependence of the Co core size of the H_c and M/M_s values for 2 nm (c) and 4 nm (d).

Supplementary Tables

Table S1. Critical exponents obtained using the finite-size scaling law fitting for Co and Gd NPs. T_c bulk values of Co = 1388 K [2] and Gd equal to 293 K [7] for reference. The errors are found between parenthesis.

	Spheres	Cylinders	Cubes
T_c -Co (K)	1388 (2)	1225 (2)	1388 (2)
d_0 -Co	0.33 (1)	0.30 (3)	0.31 (3)
z -Co	1.21 (3)	1.12 (5)	1.14 (6)
T_c -Gd (K)	290 (3)	290 (3)	290 (3)
d_0 -Gd	0.42 (2)	0.37 (2)	0.30 (3)
z -Gd	1.37 (5)	1.37 (7)	1.21 (7)