*Supplementary Material*

Simulation-trained sparse coding for high-precision phase imaging in low-dose electron holography

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Figure R1. Sparse coding of an experimental low-dose electron hologram (c) by using the dictionary (b) learned from experimental holograms (a).



Figure R2. Sparse coding of simulated holograms with the learned dictionary (Fig. 4). (a) and (b) are the original holograms with the SNR of 0.10, 0.03, respectively. (a’) and (b') are the sparse representation of (a) and (b), respectively.



Figure R3. Sparse coding of different holograms with the learned dictionary (Fig. 4). (a) is the vertically flipped hologram. (b) is the hologram with the twice wider slope. (a’) and (b') are the sparse representation of (a) and (b), respectively.