SPARSITY-BASED PIXEL SUPER RESOLUTION FOR LENS-FREE DIGITAL IN-LINE HOLOGRAPHY

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SUPPLEMENTARY FIGURES

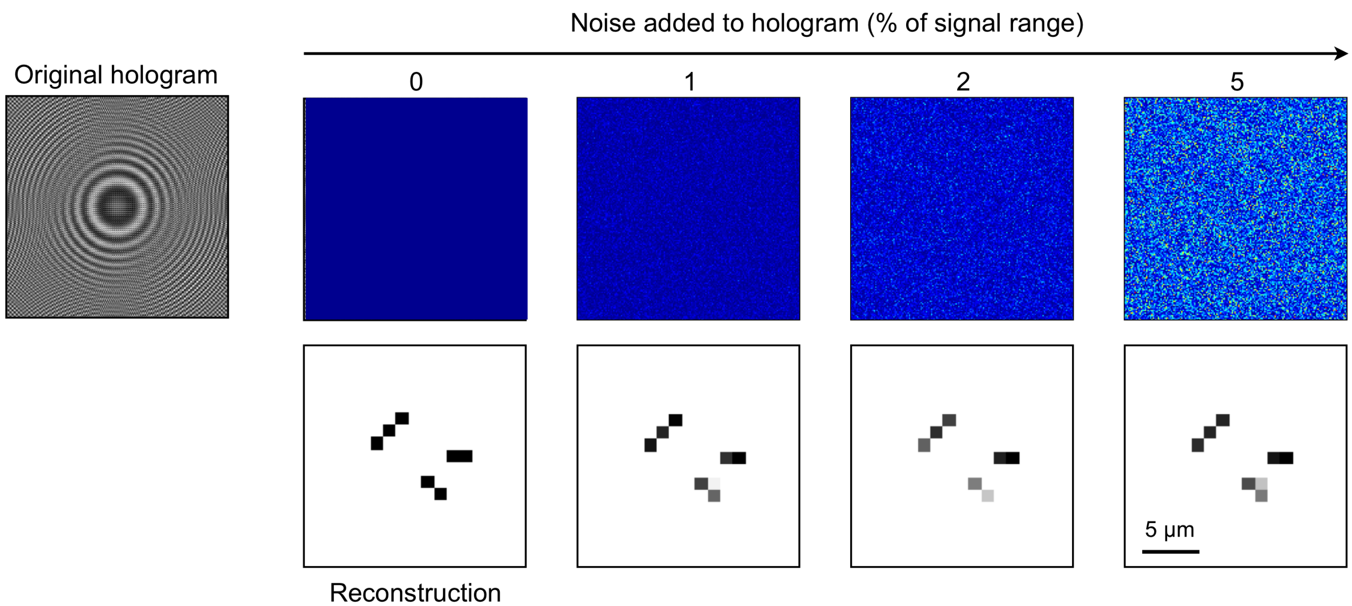

Fig. S1. Noise test of the sparsity algorithm. Gaussian noise was added to the original hologram input (left) before the sparsity-based reconstruction. The noise level was varied in proportional to the signal range in the hologram. In this example, the sparsity algorithm tolerated up to 5% of the noise level.

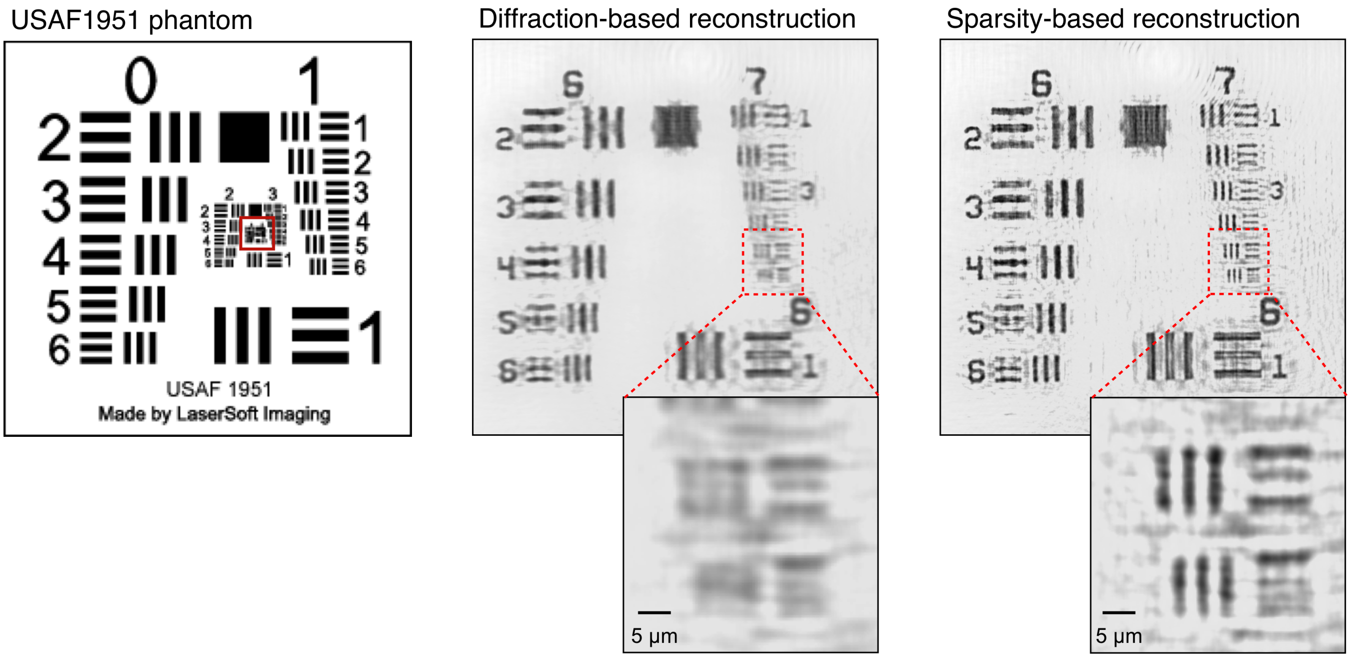

Fig. S2. Reconstruction of an USAF1951 phantom. The test patterns in the red solid box (left) were imaged by the LDIH system, and reconstructed by the diffraction-based (middle) and the sparsity-based (right) algorithms. The sparsity method showed higher resolving power than the diffraction method. The sparsity method resolved all patterns including the smallest feature with the line width of 2.1 μm.

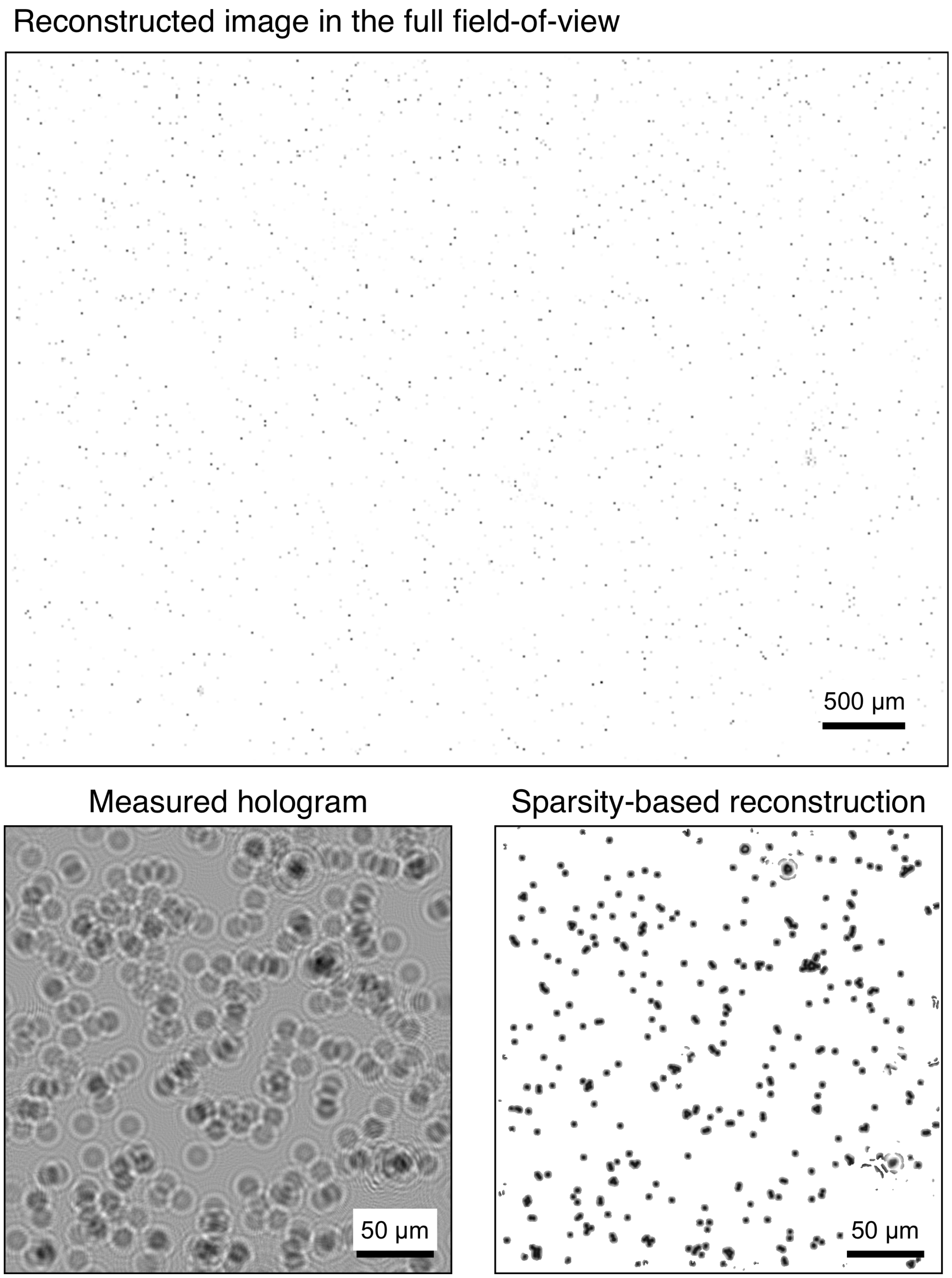

Fig. S3. Wide field-of-view imaging. With its unit magnification, the LDIH supports wide field-of-view imaging. We reconstructed >10^6 microbeads in a single view of 6 mm^2 (top). The sparsity algorithm was applied to reconstruct a high resolution object image (bottom).