Robustness to periodic noise in ghost imaging using random and inverse patterns: supplement

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We compare IPGI with the use of inverse pattern to Hadamard transform. We use GIWHT [1] as the reconstruction algorithm. This is a method that illuminates the inverse pattern and uses differential signals. Figure S1 shows reconstructed images using 32x32 patterns in simulation. The noise is 100 patterns / noise period and SD = 10,000. When the number of patterns is 2,048, both GIWHT and IPGI have not been able to reconstruct the images. However, by increasing the number of patterns to 20,480, the quality of the IPGI image has been improved. The number of patterns is limited to 2,048 (= $2*32^2$) in Hadamard transform, so it cannot be done like IPGI. This suggests that for low signal-to-noise ratios, IPGI is more robust than Hadamard transform using inverse pattern.

	GIWHT (2,048 patt.)	IPGI (2,048 patt.)	IPGI (20,480 patt.)
Reconstructed image			
MSE	0.259	0.256	0.101

Fig. S1. Reconstructed images of GIWHT, IPGI and MSE (100 patterns / noise period, SD = 10,000).

References

1. L. Wang, S. Zhao, "Fast reconstructed and high-quality ghost imaging with fast Walsh–Hadamard transform," Photon. Res. 4(6), 240-244 (2016).