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Improvement of the Signal-to-noise Ratio of a Double Random Phase  
Encoding Encryption System

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Abstract

We investigate the tolerance to data loss of a double random phase encoding encryption system. The signal-to-noise ratio of the decrypted image is investigated when a part of the encrypted image is lost. The SNR can be enhanced by reducing the ratio of the sampling number of the image to the total sampling number when electronic implementation is performed. In optical implementation, the SNR can be increased by using a phase mask with higher spatial frequency. Both the theory and computer simulations are demonstrated.