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Optical Security by Use of a Randomly Selected Binary Phase Code

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Abstract

An optical security system using a random selected binary phase code is proposed. A random binary phase encoded light is incident on a holographic recording material and writes gratings in the material with a reference plane wave. The recording material can be regarded as an optical lock while the phase code acts as the key. As the pixel number is 5 X 20, the decryption probability is less than 10-10 when arbitrary phase code is used for decryption. The decryption probability decreases dramatically as the pixel number increases. Furthermore, the security system performs good tolerance to data loss of the phase code.