Digital Communication Using Multi-mode Chaotic Lasers

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Abstract: The digital communication in a system of two multi-mode solid state chaotic lasers is investigated theoretically. If the usual method working well in a single-mode laser system is applied to a multi-mode laser system, the memory effect of the two nearest digits can cause high rate of mistakes when the digits are decoded through the subtraction of receiver output from the transmittal. By introducing the deviations of two nearest maximum and minimum fluctuations of the signal to decode the digit, the message can be decoded correctly. Also, this communication method does not critically depend on the quality of the chaotic synchronization of the two multi-mode lasers.

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