Optical Communication with Chaotic Lasers: Applications of Nonlinear Dynamics and Synchronization

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DESCRIPTION

Starting with an introduction to the fundamental physics in chaotic instabilities in laser systems, this comprehensive and unified reference goes on to present the techniques and technology of synchronization of chaos in coupled lasers, as well as the many applications to lasers and optics, communications, security and information technology. Throughout, it presents the current state of knowledge, including encoding/decoding techniques, performance of chaotic communication systems, random number generation, and novel communication technologies.

ABOUT THE AUTHOR

Atsushi Uchida received his Ph.D. degree in electrical engineering from Keio University in Yokohama, Japan, in 2000. He is an associate professor at the Department of Information and Computer Sciences at Saitama University in Saitama, Japan, and is currently working on synchronization of chaotic lasers, its applications for optical communication, secure key generation with chaotic lasers, and random number generation with chaotic lasers. Dr. Uchida is a member of the Optical Society of America, IEEE Photonics Society, and American Physical Society.