

## Synchronization of Chaotic Intensities and Phases in an Array of N Lasers

SUN Jian and ZHU Shi -Qun

School of Physical Science and Technology, Suzhou University, Suzhou 215006, China

(Received: 2004-5-9; Revised: )

**Abstract:** A linear array of N mutually coupled single-mode lasers is investigated. It is shown that the intensities of N lasers are chaotically synchronized when the coupling between lasers is relatively strong. The chaotic synchronization of intensities depends on the location of the lasers in the array. The chaotic synchronization appears between two outmost lasers, the second two outmost lasers, etc. There is no synchronization between nearest neighbors of the lasers. If the number of N is odd, the middle laser is never synchronized between any lasers. The chaotic synchronization of phases between nearest lasers in the array is examined by using the analytic signal and the Gaussian filter methods based on the peak of the power spectrum of the intensity. It can be seen that the message of chaotic intensity synchronization is conveyed through the phase synchronization.

PACS: 05.45.Xt, 42.65.Sf

Key words: chaotic synchronization, intensity phase, linear array, solid state lasers

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