

Nonlinear Physics Seminar

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Willet Science Center 101

Reducing Symmetry to Produce Stable Synchronization

Spontaneous synchronization of passively coupled fiber lasers has been successfully demonstrated in a number of recent experiments. Our iterated map model for fiber laser arrays explains these phenomena. Unexpectedly, array configurations with a high degree of physical symmetry produce coherent solutions with poor stability properties. We find that by reducing the symmetry of the array in a particular way, we can obtain robustly stable coherent solutions. Such an array design can be implemented either by combining fibers with different physical properties or by underpumping some of the lasers in the array. The same qualitative behavior has been observed experimentally.

Please join us for light refreshments at 3:15pm outside WSC 109.