Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Pattern formation through alternation of dynamics in a nonlinear optical system K. SAUNDERS, N. SUNGAR, Cal Poly, P.L. RAMAZZA, Istituto Nazionale di Ottica Applicata, J.P. SHARPE, Cal Poly — We will discuss the experimental observation of a new mechanism for pattern formation in spatially extended nonlinear systems, namely the alternation of dynamics. In this experiment we employ a nonlinear optical device known as a liquid crystal light valve (LCLV) that has been placed in an optical feedback loop. The LCLV arrangement has been studied for over a decade and exhibits a broad range of spatiotemporal behavior. We have found that by alternating one of the parameters of the system (the light intensity) between two values we can generate strong patterns. There is no patterning observed in either of the two states corresponding to each value of the parameter. Thus, alternation of the parameter is crucial. We will discuss the conditions under which patterning occurs and relate our experimental observations to recently proposed theory.

Nilgun Sungar
Cal Poly

Date submitted: 01 Dec 2004 Electronic form version 1.4