

SELF-ORGANIZED INTENSITY
SPIRALS AND TARGET PATTERNS
IN A SINGLE-MIRROR FEEDBACK SYSTEM

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S u m m a r y

We report on experimental and theoretical investigations on spatio-temporal structures in a single-mirror feedback system using sodium vapor as the nonlinear medium. Target patterns and spirals with different numbers of arms are observed. A single spiral arm has an Archimedean shape. If the feedback mirror is tilted, the patterns transform to drifting segments of circles. It is shown that the appearance of these patterns depends on self-induced and externally applied spatial phase variations. For high order spirals, the oscillation amplitude vanishes at the beam center. Simulations indicate that the oscillating perturbations include a phase singularity at the beam center.