

1096-37-108

Robyn Ferg* (fergr@stolaf.edu), Department of Mathematics, St. Olaf College, Northfield, MN 55057, and **Anna Szczekutowicz** (aszczekutowicz@yahoo.com), Hill Center for the Mathematical Sciences, Rutgers University, Piscataway, NJ 08854-8019. *Basins of attraction of ECM solutions of the Lang-Kobayashi system.*

The Lang-Kobayashi system of delay differential equations describes the behavior of the complex electric field E and inversion N of external cavity semiconductor lasers. This system has a family of periodic solutions known as external cavity modes (ECMs). As the feedback value is increased, these ECM solutions appear through saddle-node bifurcations, then lose stability through a Hopf bifurcation. Using analytical and numerical techniques, we explore a parameter region where 3 simultaneous stable ECM solutions exist, and we describe how the basins of these attractors change as the bifurcation parameter (the feedback value) is increased. We give an introduction to the corresponding problem and the resulting challenges in the case of mutually delay coupled lasers. (Received July 30, 2013)