Uniqueness and bifurcation results for the Lugiato-Lefever equation

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In this talk the nonvariational Lugiato-Lefever equation $-da'' = (i-\zeta)a+|a|^2a-if$ with periodic boundary conditions will be discussed from a bifurcation theoretic point of view. For suitable values of the parameters d, ζ, f we will find finitely many global bifurcation points with respect to the set of constant solutions. Using new a-priori estimates and uniqueness results for solutions of the equation, we will be able to provide further details concerning the number and the qualitative properties of the emanating branches. Our results, obtained in a joint work with W. Reichel (KIT), will be illustrated by bifurcation diagrams generated by the numerical software package AUTO.