BIFURCATIONS AND DISCRIMINANTS FOR RATIONAL MAPS

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Abstract. Bifurcation points of a parametrized family of maps are values of the parameter at which a dramatic shift in the dynamical behavior of the associated maps occurs. For example, bifurcation has frequently been studied for the family $f_c = z^m + c$, with $m \geq 2$, as the parameter c is varied over the complex numbers. Bifurcation points can also be thought of as the maps in the family that have colliding periodic orbits. In 1994, Morton and Vivaldi gave an algebraic description of the bifurcation points of any family of monic polynomials as the zeros of the discriminants of the dynatomic polynomials, i.e. polynomials whose roots form the periodic orbits of a dynamical system. In this talk, I will discuss my generalization of their results to the case of rational maps of degree $d \geq 2$ on $\mathbb{P}^1(k)$ for a field k.