

NEWTON'S METHOD ON BRING-JERRARD POLYNOMIALS

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ABSTRACT. In this paper we study the topology of the hyperbolic component of the parameter plane for the Newton's method applied to n -th degree Bring-Jerrard polynomials given by $P_n(z) = z^n - cz + 1$, $c \in \mathbb{C}$. For $n = 5$, using the Tschirnhaus-Bring-Jerrard nonlinear transformations, this family controls, at least theoretically, the roots of all quintic polynomials. We also study a bifurcation cascade of the bifurcation locus by considering $c \in \mathbb{R}$.

Keywords: Newton's method, holomorphic dynamics, Julia and Fatou sets, hyperbolic components, bifurcation locus.

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