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Stability of some monodromic singularities with two edges in the Newton diagram

Abstract. This work focuses on the study of monodromic singularities in planar analytic families of vector fields whose Newton diagram consists of exactly two edges. We begin by analyzing the desingularization scheme of a *minimal model* of polynomial vector fields, denoted by $\mathcal{X}$, which includes only the monomials corresponding to the vertices of the Newton diagram. We then extend this minimal model to the so-called *Brunella-Miari vector fields* $\mathcal{X} \subset \mathcal{X}^{[1]}$, incorporating all monomials associated with points lying on the edges of the Newton diagram. As a second extension, we consider vector fields $\mathcal{X}^{[1]} \subset \mathcal{X}^{[2]}$ that include higher-order terms corresponding to points located above the polygonal line in the Newton diagram. The key point of our approach is to preserve the desingularization geometry at each extension step. We provide explicit desingularization procedures, which enables the computation of the linear part of the return map Π in cases where the desingularized singularity is associated with a hyperbolic polycycle.

This is a joint work with professors Jaume Giné and Víctor Mañosa.