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Puiseux power series solutions for systems of equations

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ABSTRACT

We give an algorithm to compute term by term multivariate Puiseux series expansions with exponents in cones of series arising as local parametrizations of zeroes of systems of algebraic equations at singular points. The algorithm is an extension of Newtons method for plane algebraic curves replacing the Newton polygon by the tropical variety of the ideal generated by the system. As a corollary we deduce a property of tropical varieties of quasi-ordinary singularities.