

Applications of Monomialization to Multivariate Asymptotic Analysis

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Abstract

The monomialization of maps is an extension of the resolution of singularities of varieties to polynomial (or analytic) mappings $F : \mathbb{R}^n \rightarrow \mathbb{R}^k$. It can be applied, in particular, to describe the singularities of the fiber integral along the critical locus of F . This extends the classical technique that derives an asymptotic expansion for the fiber integral of a function (i.e. $k = 1$) near a critical value. The talk will describe a method to achieve monomialization in certain cases that is also useful for bounding uniformly the Fourier transform of the fiber integral.