

## Holomorphic Extensions of Formal Objects

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**Abstract.** We are interested on families of formal power series in  $(\mathbb{C}, 0)$  parameterized by  $\mathbb{C}^n$  ( $\hat{f} = \sum_{m=0}^{\infty} P_m(x_1, \dots, x_n)x^m$ ). If every  $P_m$  is a polynomial whose degree is bounded by a linear function ( $\deg P_m \leq Am + B$  for some  $A > 0$  and  $B \geq 0$ ) then the family is either convergent or the series  $\hat{f}(c_1, \dots, c_n, x) \notin \mathbb{C}\{x\}$  for all  $(c_1, \dots, c_n) \in \mathbb{C}^n$  except a pluri-polar set. Generalizations of these results are provided for formal objects associated to germs of diffeomorphism (formal power series, formal meromorphic functions, etc.). We are interested on describing the nature of the set of parameters where  $\hat{f} = \sum_{m=0}^{\infty} P_m(x_1, \dots, x_n)x^m$  converges. We prove that in dimension  $n = 1$  the sets of convergence of the divergent power series are exactly the  $F_\sigma$  polar sets.

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