

Abstract

By means of a sequence S of elements of a field K , we defined a K -algebra $K_S[[X]]$ of formal series called Newton interpolating series which generalized the formal power series. We study algebraic properties of this algebra and in the case when S has a finite number of distinct elements we prove that it is isomorphic to a direct sum of a finite number of known algebras. A representation of strictly convergent power series as convergent Newton interpolating series is given. Then this representation is used to study problems of the zeros of strictly convergent power series and to solve an interpolation problem. We also study the problem of the zeros of bounded Newton interpolating series. A method for p -adic analytic continuation by means Newton interpolating series is presented.