

Year: 2011

Vol.: 79

Fasc.: 3-4

**Title:** Some extensions of Alon's Nullstellensatz

**Author(s):** Géza Kós, Tamás Mészáros and Lajos Rónyai

Alon's combinatorial Nullstellensatz and in particular the resulting nonvanishing criterion is one of the most powerful algebraic tools in combinatorics, with many important applications. The nonvanishing theorem has been extended in two directions. The first and the third named authors proved a version allowing multiple points. Michałek established a variant which is valid over arbitrary commutative rings, not merely over subrings of fields. In this paper we give new proofs of the latter two results and provide a common generalization of them. As an application, we prove extensions of the theorem of Alon and Füredi on hyperplane coverings of discrete cubes.

**Address:**

Géza Kós  
Computer and Automation  
Research Institute  
Hungarian Acad. Sci  
Department of Analysis  
Eötvös Loránd University  
Budapest  
Hungary

**Address:**

Tamás Mészáros  
Department of Mathematics  
Central European University  
Budapest  
Hungary

**Address:**

Lajos Rónyai  
Computer and Automation  
Research Institute  
Hungarian Acad. Sci.  
Department of Algebra  
Budapest  
Univ. of Technology and Economics  
Budapest  
Hungary