1046-13-787 **Alexander B. Levin*** (levin@cua.edu), Department of Mathematics, The Catholic University of America, Washington, DC 20064. *Generalized Gröbner Basis Method for Computing Multivariate Hilbert Polynomials.*

Let D be a ring of polynomials in m variables $X_1, \ldots, X_m$ over a field K and let a partition of the set $\{X_1, \ldots, X_m\}$ into p disjoint subsets be fixed, so that D can be treated as a filtered ring with the natural p-dimensional filtration associated with the partition. We introduce a special type of reduction in a finitely generated free D-module and develop the corresponding generalized Gröbner basis technique that allows one to prove the existence and find invariants of a dimension polynomial in p variables associated with a finitely generated D-module M. We also prove the existence of a multivariate dimension polynomial associated with arbitrary D-submodule of M and outline a method of computation of multivariate dimension polynomials. (Received September 11, 2008)