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On the Action of Steenrod Operations on Polynomial Algebras

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Abstract: Let (A) be the mod- (p) Steenrod Algebra. Let (p) be an odd prime number and $(Z_p = Z/pZ)$. Let $(P_s = Z_p[x_1, x_2, \dots, x_s])$. A polynomial $(N \in P_s)$ is said to be hit if it is in the image of the action $(A \otimes P_s \rightarrow P_s)$. In [10] for $(p=2)$, Wood showed that if $(\nu(d+s) > s)$ then every polynomial of degree (d) in (P_s) is hit where $(\nu(d+s))$ denotes the number of ones in the binary expansion of $(d+s)$. Later in [6] Monks extended a result of Wood to determine a new family of hit polynomials in (P_s) . In this paper we are interested in determining the image of the action $(A \otimes P_s \rightarrow P_s)$. So our results which determine a new family of hit polynomials in (P_s) for odd prime numbers generalize cononical antiautomorphism of formulas of Davis [2], Gallant [3] and Monks [6].

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