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On the Action of Steenrod Operations on Polynomial Algebras

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