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William M. Singer* (singer@fordham.edu), Department of Mathematics, Fordham University, Bronx, NY 10458. *Rings of Symmetric Functions as Algebras over the Steenrod Algebra.*

We write $P^{\otimes s}$ for the polynomial ring on s letters over the field $Z/2$, equipped with the standard action of Σ_s , the symmetric group on s letters. This paper deals with the problem of determining a minimal set of generators for the invariant ring $(P^{\otimes s})^{\Sigma_s}$ as a module over the Steenrod algebra \mathcal{A} . That is, we would like to determine the graded vector spaces $Z/2 \otimes_{\mathcal{A}} (P^{\otimes s})^{\Sigma_s}$. Our main result is stated in terms of a “bigraded Steenrod algebra” \mathcal{H} . The generators of this algebra \mathcal{H} , like the generators of the classical Steenrod algebra \mathcal{A} , satisfy the Adem relations in their usual form. However, the Adem relations for the bigraded Steenrod algebra are interpreted so that Sq^0 is not the unit of the algebra; but rather, an independent generator. Our main work is to assemble the duals of the vector spaces $Z/2 \otimes_{\mathcal{A}} (P^{\otimes s})^{\Sigma_s}$, for all $s \geq 0$, into a single bigraded vector space; and to show that this bigraded object has the structure of an algebra over \mathcal{H} . (Received August 14, 2008)