1016-13-305 **Clarence W. Wilkerson*** (cwilkers@purdue.edu), Clarence W. Wilkerson, Dept. Math, Purdue University, est Lafayette, IN 47907. *Poincare' duality algebras as rings of coinvariants.* Preliminary report.

If V is a finite dimensional vector space over a field k, and W is a finite subgroup of $Aut(V)$, then the symmetric algebra $S(V^{\#})$ can be thought of as the algebra of polynomial functions on V, and it inherits an action of the group W. The algebra of invariants $S(V^{\#})^W$ is of particular interest. If it is itself a polynomial algebra, then the quotient algebra $S(V^{\#})/I$, where I is the ideal generated by the positive degree elements of $S(V^{\#})^W$ form the coinvariants and is Poincare' duality algebra under the induced multiplication.

However, if the characteristic of k is positive, the coinvariants can be a Poincare duality algebra without $S(V^{\#})^W$ being polynomial. The author and W. G. Dwyer give a generic example of this behavior. Moreover, we give a new proof, independent of the previous work of Steinberg, Kane, and T.C. Lin of the following theorem.

With notation as above, if $\mathrm{char}(k) = 0$ or p with p relatively prime to the order of W, then $S(V^{\#})/I$ is a Poincare' duality algebra if and only if $S(V^{\#})^W$ is a polynomial algebra.

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