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Abraham Broer, Montréal, Quebec H3C 3J7, Canada, and **Jianjun Chuai***
(jianjun@math.mun.ca), St. John's, NL A1C 5S7, Canada. *Modules of covariants in modular invariant theory.*

Let the finite group G act linearly on the vector space V over the field k of arbitrary characteristic. If $H < G$ is a subgroup the extension of invariant rings $k[V]^G \subset k[V]^H$ is studied using modules of covariants.

An example of our results is the following. Let W be the subgroup of G generated by the reflections in G . A classical theorem due to Serre says that if $k[V]$ is a free $k[V]^G$ -module then $G = W$. We generalize this result as follows. If $k[V]^H$ is a free $k[V]^G$ -module then G is generated by H and W , and the invariant ring $k[V]^{H \cap W}$ is free over $k[V]^W$ and generated as an algebra by H -invariants and W -invariants. (Received September 09, 2007)