ALGEBRAIC PROPERTIES OF INVARIANT IDEALS

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ABSTRACT. Let R be a polynomial ring with mn many indeterminate over complex numbers. We can think of the indeterminates as a matrix, X of size $m \times n$. Consider the group $G = \operatorname{Gl}(m) \times \operatorname{Gl}(n)$. Then G acts on R via the group action $(A, B)X = AXB^{-1}$. In 1980, DeConcini, Eisenbud, and Procesi introduced the ideals that are invariant under this group action. In the same paper, they described various properties of those ideals, e.g. associated primes, primary decomposition, and integral closures. In recent work with Sudipta Das, Tài Huy Hà, and Jonathan Montaño, we described their rational powers and proved that they satisfy the binomial summation formula. In an ongoing work, Alexandra Seceleanu and I are formulating symbolic properties of these ideals. In this talk, I will describe these ideals and the properties we are interested in. I will also showcase some results from my collaborations.