

## Polynomials on matrices, rational functions, and Berezinians

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The ring of invariant polynomials on even  $p|q \times p|q$  matrices has an infinite number of generators,  $s_r := \text{Tr}A^r$  (where  $r = 1, 2, 3, \dots$ ), if  $q > 0$ , with an infinite number of relations. Here  $\text{Tr}$  stands for supertrace,  $\text{Tr}A = \text{tr}A_{00} - \text{tr}A_{11}$ . (If  $q = 0$ , then this ring is freely generated by  $p$  generators  $s_1, \dots, s_p$ , which are ordinary traces.) An adequate and transparent picture of this ring can be obtained by considering instead of it a ring of polynomial functions on fractions  $P(z)/Q(z)$  where the numerator  $P(z)$  is a polynomial of degree  $p$  and the denominator  $Q(z)$  is a polynomial of degree  $q$ . Our considerations are inspired by the relations between Berezinians (superdeterminants) of linear operators on superspaces and rational functions.