On computing the determinant and the inverse of integer matrices

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The bit costs of exact computations on integer matrices are related to both the algebraic complexity and to the sizes of intermediately computed quantities such as temporary integers. For reducing the bit complexity of basic linear algebra problems, a main concern is thus to exploit the interplay of the algebraic structure with the intermediate expression swell. Several authors have successfully addressed the question recently. We present the techniques used by some new main results and our contribution in the field. We focus on determinant and matrix inverse computations. Part of this work has been done with Erich Kaltofen (North Carolina State University).