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David Miller* (davmiller@hartford.edu), CT. *A fast inversion algorithm for the Laurent-Vandermonde matrix.*

Although Gaussian elimination uses $\mathcal{O}(n^3)$ operations to invert an arbitrary matrix, matrices with a special Vandermonde structure can be inverted in only $\mathcal{O}(n^3)$ operations using a fast, Traub-like algorithm. The Traub algorithm has been extended from Vandermonde matrices involving monomials to polynomial-Vandermonde matrices involving real orthogonal polynomials, and the Szegő polynomials.

In this talk we consider extending the properties of the original Traub algorithm to a special class of polynomials, called the Laurent polynomials. We derive a fast $\mathcal{O}(n^2)$ Traub-like algorithm to invert the associated Laurent-Vandermonde matrix. (Received September 24, 2017)