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A FACTORED FORM OF COMPLEX ANALYTIC FUNCTIONS AND ITS APPLICATION TO FINDING PARTIAL FRACTION DECOMPOSITIONS

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Abstract. A fast algorithm is introduced to find the coefficients of the partial fraction decomposition of proper rational functions. Instead of solving a large-scale system of linear algebraic equations with full coefficient matrix or differentiating repeatedly rational functions, a special system of linear algebraic equations is solved, where the coefficient matrix is lower triangular. Therefore, there is no need for elimination, the solutions are obtained by forward substitution making the procedure very effective. The method is based on a special representation of analytic functions which has further applications in constructing iteration methods for solving nonlinear equations.

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