A GENERALIZED INVERSE FOR MATRICES

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This paper describes a generalization of the inverse of a non-singular matrix, as the unique solution of a certain set of equations. This generalized inverse exists for any (possibly rectangular) matrix whatsoever with complex elements‡. It is used here for solving linear matrix equations, and among other applications for finding an expression for the principal idempotent elements of a matrix. Also a new type of spectral decomposition is given.